Player's Edge-Plus & S-Plus Electronic Repair Manual
**Player's Edge-Plus & S-Plus Electronic Repair Manual**

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**About This Manual**

This manual was developed in conjunction with related field service manuals. Any specific questions should be addressed by the field service manual for each IGT machine type. Contact IGT Customer Service to order manuals.

**Related Documentation:**

- The **Player's Edge-Plus Field Service Manual** (p/n 821-037-02) contains information required to install, configure, troubleshoot and repair a Player's Edge-Plus machine.

- The **S-Plus Field Service Manual** (p/n 821-027-01) contains information required to install, configure, troubleshoot and repair a S-Plus machine.

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Repair Tips For Technicians

When the technician receives a board with a problem, he should verify the problem in the tester. The technician would first check the schematic to isolate the circuit. With the problem isolated, the board is put into the tester with the input or output in question activated. The technician will then use the oscilloscope to locate and follow the active signal through the circuit and its components to the faulty component(s). The multimeter is useful in checking voltages, continuity, resistance, testing diodes, and transistors.

The following suggestions are recommended for repairs:

- The basic equipment requirements for board testing are: soldering and desoldering equipment, replacement IC's, schematics, multimeter, oscilloscope, and an IGT tester.
- Visually inspect the processor board for: burned or broken traces, broken or missing components, spread pins on IC sockets, bent or folded pins on socketed IC's, and insulation crimps on molex pins.
- Perform continuity testing using a wire with ends stripped back to get into smaller connector openings.
- To repair a broken wire either solder and insulate with heat shrink or use a butt-splice type connector. Next, tug on wires to test the joint and then test for continuity.
- The technician should have access to correct pins and crimpers in order to correctly replace bad pins.
- Use as little heat as possible when removing IC's. Cut each pin next to the IC package, then remove each with a magnetic tipped soldering iron or needle-nosed pliers.
- Use new heat sink paste if required.
- When repairing traces, use rework or wire-wrap wire.

There are two J/P1 and J/P2 connectors on the S-Plus mother board. The J/P1 and J/P2 connectors will always have an A or B side designation, following a pin number (1-32). The other J/P1 and J/P2 have only one pin number.

NOTE: This manual uses the S-Plus and Player's Edge-Plus Superboard. The processor board designations should be correct for the S-Plus and Player's Edge-Plus games manufactured currently.

The motherboard and wiring harness designations are specific to the S-Plus and Player's Edge-Plus stand-up machine models.

BE AWARE that the motherboard and wiring designations will be different for other machine models (eg. Slant-Top).

Refer to the relevant field service manual for a different model type.
Tracing Inputs

Each input problem is taken individually and traced to its "opto-isolation" on the processor board. Opto-isolation is a defense against static electricity, noise, or any unwanted electrical feedback. The majority of board problems are I/O and voltage problems. These problems usually occur between opto-isolation and the board connectors. The vast majority of input problems are not board problems. Any suspect board problem should be isolated to the board, on a tester if possible, before any repair is attempted.

Start With the Problem

The simplest means of treating machine and board repairs is to start with the problem and then try to isolate the cause. Treat each potential input problem individually, and trace it from the exterior of the machine onto the processor board, to the point of opto-isolation.

The technician should verify each problem in the inputs test. The technician can then reference each input in question in this manual.

When using the diagram provided with each input problem, the following items should be kept in mind:

- Each input, when activated, sends a signal through the wiring and connectors to the mother board.
- The mother board then connects the signal via a trace to the processor board (processor board connects to the mother board at J/P1 and J/P2).
- On the processor board, typically there is a pull-up resistor pack, then a parallel to serial shift register, followed by buffers and opto-isolation.

Inputs Test

The inputs self test allow the operator to test machine inputs. The number 1 appears in the Coins Played display. During each input test, 3 digits of a 4-digit code appear in the Winner Paid display (for example, 10_0).

To test an input, locate the number for that input on the inputs table and the corresponding toggle instructions. Turn the reset key until the 2 digits on the left-hand side of the display correspond to the number of the input. As each input is tested, the logic level toggles between 1 and 0. Typically a "0" indicates that the circuit or switch is in an open state and a "1" indicates that the circuit or switch is closed.

Refer to inputs table on the next page and use the reset key to step through each input. Press the self test switch to enter the next self test page. The inputs and outputs for each S-Plus stepper slot machine may vary depending upon the physical configuration of the machine involved.
# Inputs Test

<table>
<thead>
<tr>
<th>Winner</th>
<th>Description</th>
<th>Action to Toggle Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>10_1</td>
<td>Coin In A</td>
<td>Activated only when coin comparator accepts coins in door-closed game mode; go to COIN B input test</td>
</tr>
<tr>
<td>11_1</td>
<td>Coin In B</td>
<td>Remove the coin comparator and disconnect the comparator harness; drop a coin into the coin path, between the rear encoder board mounting bracket and the black plastic insert for each optic input (B and C)</td>
</tr>
<tr>
<td>12_1</td>
<td>Coin In C</td>
<td></td>
</tr>
<tr>
<td>13_0</td>
<td>Door Optics Receiver</td>
<td>Close and firmly lower the door locking bar to its lowest position</td>
</tr>
<tr>
<td>14_1</td>
<td>Hopper Coin Out</td>
<td>Cover hopper optic with a flat, opaque object to simulate coin out</td>
</tr>
<tr>
<td>15_0</td>
<td>Hopper Probe</td>
<td>Ground hopper coin-level probe to hopper chassis</td>
</tr>
<tr>
<td>16_0</td>
<td>Spin</td>
<td>Press player panel switch or trip handle-spin mechanical switch</td>
</tr>
<tr>
<td>17_0</td>
<td>Jackpot Reset</td>
<td>Turn reset key one time</td>
</tr>
<tr>
<td>20_0</td>
<td>Play One Credit</td>
<td>Press Bet One Credit player switch</td>
</tr>
<tr>
<td>21_0</td>
<td>Play Max Credits</td>
<td>Press Play Max Credits player switch</td>
</tr>
<tr>
<td>22_1</td>
<td>Cashout Credits</td>
<td>Press Cash Out player switch</td>
</tr>
<tr>
<td>24_1</td>
<td>Reel Mechanism</td>
<td>Disconnect reel harness from J7 mother board connector</td>
</tr>
<tr>
<td>25_0</td>
<td>Self Test</td>
<td>Press self test switch one time</td>
</tr>
<tr>
<td>27_0</td>
<td>Bill Acceptor</td>
<td>Insert bill into bill acceptor</td>
</tr>
<tr>
<td>31_0</td>
<td>Drop Door</td>
<td>Completely close the drop door</td>
</tr>
<tr>
<td>40_X</td>
<td>Reel 1</td>
<td>Move first reel up (or down) one stop and return to position</td>
</tr>
<tr>
<td>41_X</td>
<td>Reel 2</td>
<td>Move second reel up (or down) one stop &amp; return to position</td>
</tr>
<tr>
<td>42_X</td>
<td>Reel 3</td>
<td>Move third reel up (or down) one stop and return to position</td>
</tr>
<tr>
<td>43_X</td>
<td>Reel 4</td>
<td>If present, move fourth reel up (or down) one stop and return</td>
</tr>
<tr>
<td>44_X</td>
<td>Reel 5</td>
<td>If present, move fifth reel up (or down) one stop and return</td>
</tr>
</tbody>
</table>

0 = a low state  
1 = a high state  
X can be 1 or 0  
The state of Reel 1-5 inputs depends upon where each reel has stopped.
Problem: Spin Switch/Handle Switch Doesn’t Function Properly

Before removing the processor board, check the following areas:

✓ Use input test 16 to verify the problem.
✓ Verify that the Spin switch and Handle switch are correctly wired using the normally open and common leads.
✓ Check button assembly (clean, with no broken or missing parts).
✓ If the microswitch is wired incorrectly, then reconnect by checking another machine.
✓ Visually inspect wires and connectors.
✓ Connect one meter lead to the normally open leg of the switch and the other meter lead connected to the chassis ground (B ground), then measure for ~8 to 10 VDC.
✓ Activate the switch—the voltage should drop to zero volts.
✓ If the voltage seems bad, use this diagram to search for damage to a wire or connector.

If that doesn’t work, try the following steps:

✓ Replace processor board with a “known good” one.
✓ If the processor board seems bad, verify in tester.
✓ If processor board is good, then replace the mother board.
✓ To repair the mother board, use this diagram to isolate the bad trace.
✓ If the mother board and processor are good, then use this diagram to test for wire continuity.

WIRE CONTINUITY TEST
Spin SW
NC to JP3-16
NO to JP3-15
Handle SW
NC to JP10-14
NO to JP10-13

MOTHER BOARD CONTINUITY CHECK
JP10-7 to JP3-16 & JP10-13
JP1-10A to JP3-15 & JP10-14

PROCESSOR BOARD TEST
Test US - if problem continues, then replace.
Test U14 - if problem continues, then replace.
Test U12 - if problem continues, then replace.
Test RPS - if problem continues, then replace.
Problem: Jackpot Reset Key Doesn’t Function Properly

Before removing the processor board, check the following areas:

- Use input test 17 to verify the problem
- Check wire and connector for defects
- Check for ~8 to 10 VDC across 2 leads to the Jackpot/Reset key
- If the voltage seems bad, use this diagram to search for damage to a wire or connector
- If the voltage is good, replace the jackpot reset switch

If that doesn’t work, try the following steps:
- Replace processor board with a “known good” one
- If the processor board seems bad, verify in tester
- If processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor are good, then use this diagram to test for wire continuity
Before removing the processor board, check the following areas:

- Use input test 20 to verify the problem
- Check button assembly (make sure the button is clean with no broken parts)
- If the microswitch is wired incorrectly, then re-connect by checking another machine of the same type
- Visually inspect wires and connectors
- Connect one meter lead to the normally open leg of the switch and the other meter lead connected to the chassis ground (B gnd), then measure for ~8 to 10 VDC
- Activate the switch - the voltage should drop to zero volts
- If the voltage tested bad, trace wires
- If the microswitch is faulty, replace it

If that doesn’t work, try the following steps:

- Replace processor board with a “known good” one
- If the processor board seems bad, verify in tester
- If processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor are good, then use this diagram to test the wire continuity
Problem: Cashout Credit Button Doesn’t Function Properly

Before removing the processor board, check the following areas:

- Use input test 22 to verify the problem
- Check button assembly (make sure the button is clean with no missing parts)
- If the microswitch is wired incorrectly, then re-connect by checking another machine of the same type
- Visually inspect wires and connectors
- Connect one meter lead to the normally open leg of the switch and the other meter lead connected to the chassis ground (B ground), then measure for ~8 to 10 VDC
- Activate the switch, the voltage should drop to zero-volts
- If the microswitch is faulty, replace it
- If the voltage seems bad, use this diagram to test for wire continuity

If that doesn’t work, try the following steps:

- Replace processor board with a “known good” one
- If the processor board seems bad, verify in tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor are good, then use this diagram to test the wire continuity
Problem: Bet Max Credits Switch Doesn’t Function Properly

Before removing the processor board, check the following areas:

✓ Use input test 21 to verify the problem
✓ Check button assembly (make sure the button is clean with no missing parts)
✓ If the microswitch is wired incorrectly, then re-connect by checking another machine of the same type
✓ Visually inspect wires and connectors
✓ Connect one meter lead to the normally open leg of the switch and the other meter lead connected to the chassis ground (B gnd), then measure for -8 to 10 VDC
✓ Activate the switch- the voltage should drop to zero volts
✓ If voltage tests bad, then use this diagram to test for wire continuity
✓ If the microswitch is faulty, replace it

If that doesn’t work, try the following steps:

❖ Replace processor board with a “known good” one
❖ If the processor board seems bad, verify in tester
❖ If processor board is good, then replace the mother board
❖ To repair the mother board, use this diagram to isolate the bad trace
❖ If the mother board and processor are good, then use this diagram to test the wire continuity
Problem: Change Switch Doesn’t Function Properly

Before removing the processor board, check the following areas:

- Use input test 23 to verify the problem
- Check button assembly (make sure the button is clean with no missing parts)
- If the microswitch is wired incorrectly, then re-connect by checking another machine of the same type
- Visually inspect wires and connectors
- Connect one meter lead to the normally open leg of the switch and the other meter lead connected to the chassis ground (B gnd), then measure for −8 to 10 VDC
- Activate the switch—the voltage should drop to zero volts
- If the voltage tested bad, then use this diagram to test for wire continuity
- If a faulty microswitch, then replace it

If that doesn’t work, try the following steps:

- Replace processor board with a “known good” one
- If the processor board seems bad, verify in tester
- If processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor are good, then use this diagram to test for wire continuity
Problem: Can’t Access Self Test Mode

Before removing the processor board, check the following areas:

✓ Check the self test button for broken wires
✓ Check the wire and connectors for defects
✓ Replace the self test switch

If that doesn’t work, try the following steps:

⊙ Replace processor board with a “known good” one
⊙ If the processor board seems bad, verify in tester
⊙ If processor board is good, then replace the mother board
⊙ To repair the mother board, use this diagram to isolate the bad trace
⊙ If the mother board and processor are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
J/P3-14 to J/P3-13

MOTHER BOARD CONTINUITY CHECK
J/P5-13 to J/P1-195

PROCESSOR BOARD TEST
Test U6 - if problem continues, then replace
Test U5 - if problem continues, then replace
Test U14 - if problem continues, then replace
Test U21 - if problem continues, then replace
Test U12 - if problem continues, then replace
Test RPS - if problem continues, then replace
Problem: Constant "Door Open" State

Before removing the processor board, check the following areas:

- Use input test 13 to verify the problem
- Check alignment of door optics
- Determine if the phototransistor works by shining a flashlight on it
- If the phototransistor works, then replace the LED
- If the phototransistor is not activated by the flashlight, then replace it
- Check optic alignment (door LED to phototransistor on chassis)
- Verify that the bill validator door switch is closed
- Visually inspect wires and connectors
- Disconnect LED at J/P170, and test for -5VDC
- Disconnect phototransistor at J/P171 and test for -8 to 10VDC

If that doesn't work, try the following steps:

- If the voltage seems bad on J/P170 and J/P171, then replace the processor board with a "known good" one
- If the processor board seems bad, then verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the processor board and mother board are good, then perform the wire continuity test
Problem: Coin-In Timeout (Optic Sensors Blocked for Over 100 msec)

Before removing the processor board, check the following areas:

- Use inputs test 11 & 12 to verify the problem
- Check for obstructions in the ABC optics
- If diverter paddle doesn’t move quickly, clean and repair
- Unplug the 10 pin plug at J/P50 to measure pins 1, 3, & 4 for ~8 VDC and Vb at pin 8 (ground lead on chassis)
- Check pin 7 for ground (green wire)
- If voltage is good, replace ABC optics
- If voltage seems bad, check harness wiring and plugs
- Replace ABC optics, and test

If that doesn’t work, try the following steps:

- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity
Problem: Extra Coin Paid Out (3100 Code)

Before removing the processor board, check the following areas:

- Use input test 14 to verify the problem
- Check hopper brake and brake spring
- Check hopper pinwheel and wiper
- Check optics and optic wire for damage
- Perform hopper test (self test 3), if problem recurs replace optics
- With the esculator hopper, coin-out optics and mechanical flag may need adjustment or spring may need replacement
- Check machine for possible tampering or cheating
- Verify that the optic ground lead is secured to the chassis optics connector
- Visually inspect wires and connectors

If that doesn't work, try the following steps:

- Replace processor board with a "known good" one
- If the processor board seems bad, verify in tester
- If processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad traces
- If the mother board and processor are good, then use this diagram to test the wire continuity

Wire Continuity Test
LED Side: JP10-9 to JP10-10
DET Side: JP19-8 to JP19-9

Mother Board Continuity Check
JP10-9 to JP1-13B
JP10-10 to JP5-24B

Processor Board Test
Test U6 - if problem continues, then replace.
Test U14 - if problem continues, then replace.
Test U21 - if problem continues, then replace.
Test U12 - if problem continues, then replace.
Test RP4 - if problem continues, then replace.
Before removing the processor board, check the following areas:

- Use input test 14 to verify the problem
- Perform the hopper test in the self test mode, if problem recurs then replace optics
- Verify Vb (-8 to 10 VDC) is at hopper plug (J/P19-9 to J/P19-10) and check connections
- Check for any physical reason why coin stays in the optics for over 700m sec.
- Clean optics, and test
- Check optic and optic wires for damage
- Verify optic ground lead is secure to chassis and optics connector
- With escalator hopper, coin-out optics and mechanical flag may need adjustment or spring replacement
- Visually inspect wires and connectors

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity
Problem: Empty Hopper (3300 Code - Hopper Optic Does Not Sense a Coin For 7-8 sec)

Before removing the processor board, check the following areas:

- Check for low or empty hopper
- If coins are jammed, clear jam
- If coins are doubled-up in escalator of the hopper, consider replacing entry plate, and/or shimming out pinwheel, and/or replacing pinwheel
- Perform hopper test in self test 3 (watch the hopper in action to spot problem)
- Visually inspect wires and connectors
- Check hopper motor, gearbox, and roll pin (replace if necessary)
- Verify optic ground lead is secure to chassis optics connector
- With escalator hopper, coin-out optics and mechanical flag may need adjustment or spring may need replacement.

If that doesn't work, try the following steps:

- Replace processor board with a "known good" one
- If the processor board seems bad, verify in tester
- If processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor are good, then use this diagram to test for wire continuity
Problem: Hopper Overflow

Before removing the processor board, check the following areas:

☑ Visually inspect for coins bridging the probe (especially $ machines)
☑ Check diverter function (output test 33)
☑ Use input test 15 to verify that the probe is functional
☑ Check wire and connectors for defects

If that doesn't work, try the following steps:

☑ Replace processor board with a “known good” one
☑ If the processor board seems bad, verify in tester
☑ If processor board is good, then replace the mother board
☑ To repair the mother board, use this diagram to isolate the bad trace
☑ If the mother board and processor are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP19-7 (hopper plug) to JP1-20B

MOTHER BOARD CONTINUITY CHECK
JP10-5 to JP1-20B

PROCESSOR BOARD TEST
Test U14 - if problem continues, then replace.
Test U21 - if problem continues, then replace.
Test U12 - if problem continues, then replace.
Test RP8 - if problem continues, then replace.
Before removing the processor board, check the following areas:

✓ Use input test 40 to 44 to verify the problem (check for flickering on the door)
✓ If so, verify that the encoder ring is not damaged
✓ Replace the problem reel with a known good reel
✓ If replacement reel works, replace optics on problem reel
✓ If problem remains, visually inspect wires and connectors to the mother board
✓ Check for ~10 to 11 VDC across pins 8 & 9 of the reel plug

If that doesn't work, try the following steps:

⊙ Replace processor board with a "known good" one
⊙ If the processor board seems bad, verify in tester
⊙ If processor board is good, then replace the mother board
⊙ To repair the mother board, use this diagram to isolate the bad trace
⊙ If the mother board and processor are good, then use this diagram to test for wire continuity
Problem: Reel Mech Installed Loop (49 Code)

Before removing the processor board, check the following areas:

☑ Use input test 24 to verify the problem
☑ Check reel plugs for a firm connection
☑ Check for a blue jumper on the male side of the reel plugs
☑ Check for a loose Molex pin on the connector
☑ Refer to the diagram below and for the wire continuity

If that doesn't work, try the following steps:

☑ Replace processor board with a "known good" one
☑ If the processor board seems bad, verify in tester
☑ If processor board is good, then replace the mother board
☑ To repair the mother board, use this diagram to isolate the bad trace
☑ If the mother board and processor are good, then use this diagram to test the wire continuity

**WIRE CONTINUITY TEST**
JP7-7 to JP7-5
JP7-7 to JP7-6

**MOTHER BOARD CONTINUITY CHECK**
JP7-7 to JP1-16A
JP7-8 to JP7-6 to JP10-7

**PROCESSOR BOARD TEST**
Test U6 - If problem continues, then replace
Test U5 - If problem continues, then replace
Test U14 - If problem continues, then replace
Test U21 - If problem continues, then replace
Test U12 - If problem continues, then replace
Test RPS - If problem continues, then replace
Problem: Bill Validator Won't Accept Bills (No Vend Signal)

Before removing the processor board, check the following areas:
- Use input test 27 to test the bill credit signal from the validator
- Check wires and connectors for defects
- Use output test 26 to verify validator enabled

If that doesn't work, try the following steps:
- Replace validator with a "known good" one
- Replace processor board with a "known good" one
- If the processor board seems bad, verify in tester
- If processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
4 to JP6-4
3 to JP6-3

MOTHER BOARD CONTINUITY CHECK
JP2-7 to JP1-13A
JP6-4 to JP10-7

PROCESSOR BOARD TEST
Test US - if problem continues, then replace
Test US - if problem continues, then replace
Test U14 - if problem continues, then replace
Test U21 - if problem continues, then replace
Test U12 - if problem continues, then replace
Test RPS - if problem continues, then replace
S-Plus Outputs: Introduction

Start With the Problem

The simplest means of treating machine and board repairs is to start with the problem and then try to isolate the cause. Treat each output problem individually, and trace it from the exterior of the machine onto the processor board, if necessary.

When solving an output problem, consider the following items:

- Each output, when activated, is energized through the wiring and connectors from the mother board.
- The mother board connects directly to the processor board (processor board connects to the mother board at J/P1 and J/P2).
- The processor board typically has a driver (e.g. triac) that is activated by an output pin on the parallel side of a shift register.

Output Section of the Processor Board

The output section contains four 10-bit shift registers (U8, U9, U23 and U24). Each shift register requires input from four common inputs. Each shift register requires digital activity to pin 14 (serial data), pin 4 (serial clock), pin 7 (load pulse), and pin 13 (enable). Each of these inputs is protected by an opto-isolator with 2 buffers; serial data out (U33) with the buffer U22; ENA (U26) with the buffer U21 and U22; serial clock (U34) with the buffer U22; and load (U13) with buffers U21 and U22.

Outputs Test

The outputs test page allows the operator to test machine outputs. The number 2 appears in the Coins Played display. During each output test, 2 digits of a 4-digit code appear in the Winner Paid display (for example, 10_ _).

To test an output, locate the number for that output on the outputs table and the corresponding toggle instructions. Turn the reset key until the 2 digits on the left-hand side of the display correspond to the number of the input. Press the Spin switch to activate/deactivate the output.
<table>
<thead>
<tr>
<th>Winner Paid</th>
<th>Description</th>
<th>Action to Toggle Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>10_</td>
<td>Coin Drop Meter</td>
<td>Press Spin Reels switch to test coin-to-drop-box counter</td>
</tr>
<tr>
<td>11_</td>
<td>Coin-Out Meter</td>
<td>Press Spin Reels switch to test coin-out counter</td>
</tr>
<tr>
<td>12_</td>
<td>Coin-In Meter</td>
<td>Press Spin Reels switch to test coin-in counter</td>
</tr>
<tr>
<td>13_</td>
<td>B Switch (SDS)</td>
<td>Press Spin Reels switch to test B switch</td>
</tr>
<tr>
<td>14_</td>
<td>Hopper Drive #2</td>
<td>Press Spin Reels switch to activate test.</td>
</tr>
<tr>
<td>15_</td>
<td>Stepper Motor Direction</td>
<td>(Bench-level processor board test only)</td>
</tr>
<tr>
<td>16_</td>
<td>Mechanical Bell</td>
<td>Press Spin Reels switch to hear mechanical bell</td>
</tr>
<tr>
<td>17_</td>
<td>Cancelled Credits Meter</td>
<td>Press Spin Reels switch to test the cancelled credits counter</td>
</tr>
<tr>
<td>20_</td>
<td>Payline Light #3</td>
<td>Press Spin Reels switch to illuminate third-coin payline</td>
</tr>
<tr>
<td>21_</td>
<td>Payline Light #4</td>
<td>Press Spin Reels switch to illuminate fourth-coin payline</td>
</tr>
<tr>
<td>22_</td>
<td>Payline Light #5</td>
<td>Press Spin Reels switch to illuminate fifth-coin payline</td>
</tr>
<tr>
<td>23_</td>
<td>Payline Light #6</td>
<td>Press Spin Reels switch to illuminate sixth-coin payline</td>
</tr>
<tr>
<td>24_</td>
<td>Door Optics Transmitter</td>
<td>Press Spin Reels switch to test door optics transmitter</td>
</tr>
<tr>
<td>25_</td>
<td>Games Played Meter</td>
<td>Press Spin Reels switch to test games played counter</td>
</tr>
<tr>
<td>26_</td>
<td>Bill Acceptor</td>
<td>Press Spin Reels switch to test bill acceptor enable</td>
</tr>
<tr>
<td>27_</td>
<td>Jackpot Coins</td>
<td>Press Spin Reels switch to test jackpot counter</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Winner Paid</th>
<th>Description</th>
<th>Action to Toggle Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>31_</td>
<td>Change Lamp</td>
<td>Press Spin Reels switch to illuminate change lamp</td>
</tr>
<tr>
<td>32_</td>
<td>Handle Release</td>
<td>Press Spin Reels switch to hear handle release activate</td>
</tr>
<tr>
<td>33_</td>
<td>Diverter</td>
<td>Press Spin Reels switch to see coin-channel diverter move</td>
</tr>
<tr>
<td>34_</td>
<td>Coin Lockout</td>
<td>Press Spin Reels switch to hear coin lockout activate</td>
</tr>
<tr>
<td>35_</td>
<td>Hopper Drive #1</td>
<td>Press Spin Reels switch to activate test.</td>
</tr>
<tr>
<td>36_</td>
<td>Coin Stepper #1 Lamps</td>
<td>Press Spin Reels switch to illuminate first-coin payline</td>
</tr>
<tr>
<td>37_</td>
<td>Coin Stepper #2 Lamps</td>
<td>Press Spin Reels switch to illuminate second-coin payline</td>
</tr>
<tr>
<td>40_</td>
<td>Stepper Motor Power Sup.</td>
<td>(Bench-level processor board test only)</td>
</tr>
<tr>
<td>41_</td>
<td>Insert Coin Lamp</td>
<td>Press Spin Reels switch to illuminate Insert Coin lamp</td>
</tr>
<tr>
<td>42_</td>
<td>Coin Accepted Lamp</td>
<td>Press Spin Reels switch to illuminate Coin Accepted lamp</td>
</tr>
<tr>
<td>43_</td>
<td>Jackpot/Hand Pay Lamp</td>
<td>Press Spin Reels switch to illuminate Jackpot/Hand pay lamp</td>
</tr>
<tr>
<td>44_</td>
<td>Bet Maximum Credits</td>
<td>Press Spin Reels switch to illuminate Bet Maximum Credits</td>
</tr>
<tr>
<td>45_</td>
<td>Bet One Credit Switch Lamp</td>
<td>Press Spin Reels switch to illuminate Bet One Credit switch</td>
</tr>
<tr>
<td>46_</td>
<td>Cashout Credits Switch</td>
<td>Press Spin Reels switch to illuminate Cashout Credits switch</td>
</tr>
</tbody>
</table>
Problem: Coin-In Meter is Nonfunctional or Locked Between Digits

Before removing the processor board, check the following areas:

- Use output test 12 to verify the problem
- Check wire and connector for defects
- Verify meter lead is seated in position #2 in terminal block

If that doesn’t work, try the following steps:

- If the meter is locked up, then replace the coin-in meter and retest
- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP1-45-2 to JP6-4

MOTHER BOARD TEST
JP5-4 to JP6-7B
JP6-6 to JP2-17B
JP7-5 & 6 to JP10-7

PROCESSOR BOARD TEST
Check from K2 to edge for bared trace.
Test K2 (SP1210X), if problem continues, then replace.
Test U20, if problem continues, then replace.
Test C5 (shorted cap) – replace
Problem: Coin-Out Meter is Nonfunctional or Locked Between Digits

Before removing the processor board, check the following areas:

- Use output test 11 to verify the problem
- Check wire and connector for defects
- Verify meter lead is seated in position #3 in terminal block

If that doesn't work, try the following steps:

- If the meter is locked up, then replace the coin-out meter and retest
- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP1-45-3 to JP5-6
JP6-5 to JP9-6

MOTHER BOARD TEST
JP5-6 to JPR-86
JP9-8 to JP2-178
JP7-5 & 6 to JP10-7

PROCESSOR BOARD TEST
Check from K1 to edge for burned trace
Test K1 (JP121DX), if problem continues, then replace.
Test U25, if problem continues, then replace.
Test C4 (shorted cap) — replace
Problem: Coin Drop Meter is Nonfunctional or Locked Between Digits

Before removing the processor board, check the following areas:

- Use output test 10 to verify the problem
- Check wire and connector for defects
- Verify meter lead is seated in position #4 in the terminal block

If that doesn't work, try the following steps:

- If the meter is locked up, replace the drop meter and retest
- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity
Problem: Games Played Meter is Nonfunctional or Locked Between Digits

Before removing the processor board, check the following areas:

✓ Use output test 25 to verify the problem.
✓ Check wire and connector for defects.
✓ Verify that the meter lead is seated in position #6 in terminal block.
✓ Remove and replace the games played meter, and test.

If that doesn't work, try the following steps:

☞ Replace the processor board with a "known good" one.
☞ If the processor board seems bad, verify in the tester.
☞ If the processor board is good, then replace the mother board.
☞ To repair the mother board, use this diagram to isolate the bad trace.
☞ If the mother board and processor board are good, then use this diagram to test for wire continuity.

WIRE CONTINUITY TEST
JP148-6 to JP8-3
JP146-1 to JP5-1

MOTHER BOARD TEST
JP5-3 to JP2-8A
JP8-3 to JP5-17B
JP10-7 to JP7-5 & 6
JP5-1 to JP8-5

PROCESSOR BOARD TEST
Check from K5 to edge for burned trace.
Test K3 (SP121DX) - if problem continues, then replace.
Test U20 - if problem continues, then replace.
Test C8 (shorted cap) - replace.
Problem: Jackpot X10 Meter is Nonfunctional

Before removing the processor board, check the following areas:

✓ Use output test 27 to verify the problem
✓ Check wire and connector for defects
✓ Verify meter lead is seated in position #5 in terminal block
✓ Replace the jackpot meter and retest

If that doesn't work, try the following steps:

○ Replace the processor board with a "known good" one
○ If the processor board seems bad, verify in the tester
○ If the processor board is good, then replace the mother board
○ To repair the mother board, use this diagram to isolate the bad trace
○ If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP145-5 to JP5-2
JP145-1 to JP5-1

MOTHER BOARD TEST
JP5-2 to JP2-139
JP7B-6 to JP2-179
JP5-1 to JP6-5

PROCESSOR BOARD TEST
Check from K6 to edge for burned trace
Test K6 (SP1210X) if problem continues, then replace,
Test U23, if problem continues, then replace,
Test C9 (shorted cap) – replace
Problem: All Meters are Nonfunctional or Locked Between Digits

Before removing the processor board, check the following areas:

✓ Use output test 10, 11, 12, 25, and 27 to verify the problem
✓ Check (24VAC 6A) fuse
✓ Check wire and connector for defects
✓ Check that terminal block wires are seated adjacent starting at position #1

If that doesn't work, try the following steps:

ië Replace the processor board with a "known good" one
ië If the processor board seems bad, verify in the tester
ië If the processor board is good, then replace the mother board
ië To repair the mother board, use this diagram to isolate the bad trace
ië If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP145-1 to JP5-1

MOTHER BOARD TEST
JP5-1 to JP8-5
JP10-7 to JP7-5 & 6

PROCESSOR BOARD
Test U23 - if problem continues, then replace.
Test U33, U29, U13 & U34
Problem: Bell is Nonfunctional

Before removing the processor board, check the following areas:

- Use output test 16 to verify the problem
- Check wires and connectors for defects
- Use this diagram to test for wire continuity

If that doesn’t work, try the following steps:

- If the bell is nonfunctional, then replace the bell, and test
- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

Wire Continuity Test
JP11-2 to JP2-18B
JP11-2 to JP7-58B
JP11-2 to JP8-5
JP11-2 to JP2-17B

Mother Board Test

Processor Board
Check from K8 to edge for burned traces
Test Kit (SP1210X), if problem continues, then replace.
Test U23, if problem continues, then replace.
Problem: Diverter is Nonfunctional

Before removing the processor board, check the following areas:

✓ Use input test 15 to verify if the problem is the hopper full probe
✓ Use output test 33 to verify the diverter problem
✓ Check (24 VAC) fuse
✓ Replace coil and retest

If that doesn't work, try the following steps:

☐ Replace the processor board with a "known good" one
☐ If the processor board seems bad, verify in the tester.
☐ If the processor board is good, then replace the motherboard.
☐ To repair the mother board, use this diagram to isolate the bad trace.
☐ If the mother board and processor board are good, then use this diagram to test for wire continuity.

WIRE TEST CONTINUITY
JP169-1 to JP1-27
JP169-2 to JP1-29

MOTHER BOARD TEST
JP1-27 to JP2-15B
JP1-23 to JP8-5
JP19-7 to JP7-5 & 6

PROCESSOR BOARD TEST
Check from Q17 to edge (JP2-16B & JP2-17B) for burned trace
Test Q17 (MIC333) - if problem continues, then replace.
Test Q16 (MIC333) - if problem continues, then replace.
Test U16
Test P14
Test C2 (shorted cap) — replace
Problem: Lockout is Nonfunctional

Before removing the processor board, check the following areas:

✓ Use output test 34 to verify the problem
✓ Check (24 VAC) fuse
✓ Replace lockout coil, and test

If that doesn’t work, try the following steps:

○ Replace the processor board with a “known good” one
○ If the processor board seems bad, verify in the tester
○ If the processor board is good, then replace the mother board
○ To repair the mother board, use this diagram to isolate the bad trace
○ If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE TEST CONTINUITY
JP51-22 to JP1-23
JP51-3 to JP1-2B

MOTHER BOARD TEST
JP1-23 to Q11; Q11 to JP2-18A
JP1-22 to JP8-5
JP6-6 to JP2-17B
JP16-7 to JP7-5 & 6

PROCESSOR BOARD TEST
Check from Q18 to edge (JP2-18A & JP2-17B) for burned trace.
Test Q18 (MAC23030) - if problem continues, then replace.
Test U17 (MC23031) - if problem continues, then replace.
Test U8
Test R13
Test C3 (shorted cap) - replace
Problem: Handle Release Coil Stays Locked or Won’t Lock

Before removing the processor board, check the following areas:

✓ Use output test 32 on later programs
✓ Check leads to coil
✓ Check hammer spring and ratchet spring in handle mechanism
✓ Check (24 VAC) fuse
✓ Replace handle release coil, and test

If that doesn’t work, try the following steps:

○ Replace the processor board with a “known good” one
○ If the processor board seems bad, verify in the tester
○ If the processor board is good, then replace the mother board
○ To repair the mother board, use this diagram to isolate the bad trace
○ If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE TEST CONTINUITY
JP210-5 to JP10-12
JP210-6 to JP10-11

MOTHER BOARD TEST:
JP10-12 to JP5-5
JP10-11 to D2
D3 to JP5-14A & 14B
JP10-7 to JP7-5 & 6

PROCESSOR BOARD TEST:
Check from Q16 to edge (JP5-18A & JP5-7B) for burned trace
Test Q16 (MAC3030) - if problem continues, then replace.
Test U15 (MAC3031) - if problem continues, then replace.
Test U9
Test R15
Test C1 (shorted cap) - replace

S-Plus Outputs
Problem: Diverter, Lockout, and Handle Release are All Nonfunctional

Before removing the processor board, check the following areas:
- Use output test 33 and 34 to verify the problem
- Check (24 VAC) fuse

If that doesn’t work, try the following steps:
- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE TEST CONTINUITY
JP10-12 to Solenoid
JP10-11 to Solenoid

MOTHER BOARD TEST
JP1-29 to JP5-5
JP10-7 to JP7-5 & 8

PROCESSOR BOARD TEST
Check JP2-17B for burned traces
Test U9
Problem: Hopper Won't Activate

Before removing the processor board, check the following areas:

- Check Cashout switch function in input test 22
- Use outputs test 35 and 14 (If either test activates the hoper then either the SSR or the processor is defective)
- Check for loose or defective wires
- Test for 110VAC across J/P19-11&12
- If the 110VAC is good, replace the Hopper SSR and test
- Use another hopper to determine if the motor seems bad

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE TEST CONTINUITY
J/P10-5 to SSR
J/P10-6 to SSR
J/P7-5 to SSR
Check at Beau Plug (J/P19-11 and J/P19-12)

MOTHER BOARD TEST
J/P10-5 to J/P1-10A
J/P10-5 to J/P1-10B

PROCESSOR BOARD
U9-9 to J/P1-10B
U23-18 to J/P1-10A
Test A22 & R23 (750Ω ea.)
Problem: Runaway Hopper

Before removing the processor board, check the following areas:

- Use outputs test 35 and 14 (if either test activates the hopper, then either the SSR or the processor board is defective)

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

Wire Test Continuity
JP10-5 to SSR
JP10-8 to SSR
JP7-5 to SSR
Check at Beau Plug (JP19-11 and JP19-12)

Mother Board Test
JP10-6 to JP1-10A
JP19-3 to JP1-10B

Processor Board Test
U9-8 to JP1-10B
U29-18 to JP1-10A
Test R22 & R23
Before removing the processor board, check the following areas:

- Use input test 13 to verify that the phototransistor is good (use a flashlight to simulate a LED).
- Measure Vb at J1/P170 pins 1 & 2 (~5VDC).
- Check wires and connectors for defects.
- Replace the LED, and test

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one.
- If the processor board seems bad, verify in the tester.
- If the processor board is good, then replace the mother board.
- To repair the mother board, use this diagram to isolate the bad trace.
- If the mother board and processor board are good, then use this diagram to test for wire continuity.
Problem: Display Board is Nonfunctional

Before removing the processor board, check the following areas:

- Replace the display board, and test

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity
Problem: SDS Not Receiving Jackpot or Door Open or Handle Signals

Before removing the processor board, check the following areas:

✓ Check 7V, 8A fuse
✓ Use output test 13 to verify the problem

If that doesn't work, try the following steps:

○ Replace the processor board with a "known good" one
○ If the processor board seems bad, verify in the tester
○ If the processor board is good, then replace the mother board
○ To repair the mother board, use this diagram to isolate the bad trace
○ If the mother board and processor board are good, then use this diagram to test for wire continuity

MOTHER BOARD TEST
JP3-6 to JP1-11B
JP10-7 to JP1-28A and JP6-2

PROCESSOR BOARD TEST
Test Q19 (2N3904) - if problem continues, then replace.
Test R40 (470 OHM) - if problem continues, then replace.
Test R44 (10K OHM) - if problem continues, then replace.
Test R42 (10K OHM) - if problem continues, then replace.
Test U23 - if problem continues, then replace.
Problem: Reel Motor Driver – One is Nonfunctional

Before removing the processor board, check the following areas:

✓ Check reel input section to verify reel optic has no problem

If that doesn’t work, try the following steps:

○ Replace the processor board with a “known good” one
○ If the processor board seems bad, verify in the tester
○ If the processor board is good, then replace the mother board
○ To repair the mother board, use this diagram to isolate the bad trace
○ If the mother board and processor board are good, then use this diagram to test for wire continuity

MOTHER BOARD CONTINUITY TEST
JP7-26 to JP1-303
JP7-1 to JP2-17A
JP3-2B to JP2-17A
JP7-22 to JP2-16B

PROCESSOR BOARD TEST
Replace U10 if problem recurs, then replace shunt diodes Test U5S and U27
Test U23 thru U33, U2B, U19, & U34

Note: shunt diodes not used with new driver pin 32102990
Replace U10 with number TY4047/SAA-1042V
Obsolete – SAA1042A
Old pin 32100480 (requires shunt diodes)
Problem: Reel Motor Driver – Two is Nonfunctional

Before removing the processor board, check the following areas:

- Check reel input section to verify reel optic has no problem

If that doesn't work, try the following steps:

- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

MOTHER BOARD CONTINUITY TEST
JP7-21 to JP2-19A
JP7-20 to JP2-20B
JP7-18 to JP2-21B
JP7-17 to JP2-20A

PROCESSOR BOARD TEST
Check U2 - if problem recurs, then replace shunt diodes
Test U23 thru U33, U28, U13, & U34

Note: shunt diodes not used with new driver p/n 32102900
Replace U2 with p/n TY40477AA-1042V
Problem: Reel Motor Driver – Three is Nonfunctional

Before removing the processor board, check the following areas:

- Check reel input section to verify reel optic has no problem

If that doesn’t work, try the following steps:

- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

MOTHER BOARD CONTINUITY TEST

JP7-17 to JP3-21A
JP7-18 to JP3-22B
JP7-15 to JP3-23A
JP7-14 to JP3-23B

PROCESSOR BOARD TEST

Check U11 - If problem recurs, then replace shunt diodes
Test U25 and U27
Test U23 to U33, U26, U13, & U34

Note: shunt diodes not used with new driver (p/n 32102290)
Replace U11 with p/n TY54475A-1042V
Problem: Reel Motor Driver – Four is Nonfunctional

Before removing the processor board, check the following areas:

- Check reel input section to verify reel optic has no problem

If that doesn't work, try the following steps:

- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the motherboard
- To repair the motherboard, use this diagram to isolate the bad trace
- If the motherboard and processor board are good, then use this diagram to test for wire continuity

MOTHER BOARD CONTINUITY TEST
- JRP7-9 to JRP1-10B
- JRP7-10 to JRP1-10A
- JRP7-37 to JRP2-15A
- JRP7-3 to JRP2-13A

PROCESSOR BOARD TEST
- Check U1 - if problem recurs, then replace shunt diodes
- Test U25 and U27
- Test U23 thru U33, U28, U13, & U34

Note: shunt diodes not used with new driver p/n 32102390
Replace U1 with p/n TY4047SAA-1042V
Problem: Reel Motor Driver – Five is Nonfunctional

Before removing the processor board, check the following areas:

- Check reel input section to verify reel optic has no problem

If that doesn't work, try the following steps:

- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

MOTHER BOARD CONTINUITY TEST

- J/P7-13 to J/P2-23A
- J/P7-4 to J/P2-24A
- J/P7-25 to J/P2-27A
- J/P7-11 & 12 to J/P2-25B

PROCESSOR BOARD TEST

Check U3 - if problem recurs, then replace shunt diodes
Test U25 and U27
Test U23 thru U37, U26, U13, & U34

Note: shunt diodes not used with new driver p/n 32102990
Replace U3 with p/n TY4077SAA-1042V
Problem: Insert Coin Lamp is Nonfunctional

Before removing the processor board, check the following areas:

- Use output test 41 to verify the problem
- Replace the lamp, and test
- Check wires and connectors for defects

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP59-2 to JP1-33
JP60-4 to JP1-34

MOTHER BOARD TEST
JP1-33 to JP1-27A
JP1-34 to JP3-3

PROCESSOR BOARD TEST
Test Q51(L2012E) - if problem continues, then replace
Test R57 - if problem continues, then replace
Test U8 - if problem continues, then replace
Problem: Coin Accept Lamp is Nonfunctional

Before removing the processor board, check the following areas:

✓ Use output test 42 to verify the problem
✓ Replace the lamp, and test
✓ Check wires and connectors for defects
✓ Use this diagram to test for wire continuity

If that doesn't work, try the following steps:

✓ Replace the processor board with a "known good" one
✓ If the processor board seems bad, verify in the tester
✓ If the processor board is good, then replace the mother board
✓ To repair the mother board, use this diagram to isolate the bad trace
✓ If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP69-3 to JP1-32
JP69-4 to JP1-34

MOTHER BOARD TEST
JP1-32 to JP1-27B
JP1-34 to JP9-3

PROCESSOR BOARD TEST
Test Q4(L201E2) - if problem continues, then replace
Test JP7 - if problem continues, then replace
Test UB - if problem continues, then replace
Problem: Bet Max Lamp is Nonfunctional

Before removing the processor board, check the following areas:
✓ Use output test 44 to verify the problem
✓ Replace the lamp, and test
✓ Check wires and connectors for defects

If that doesn't work, try the following steps:
○ Replace the processor board with a "known good" one
○ If the processor board seems bad, verify in the tester
○ If the processor board is good, then replace the mother board
○ To repair the mother board, use this diagram to isolate the bad trace
○ If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP200-1 to JP3-23
JP200-11 to JP3-12

MOTHER BOARD TEST
JP3-23 to JP1-25B
JP3-12 to JP6-3

PROCESSOR BOARD TEST
Test Q1(L301E3) - If problem continues, then replace
Test RP7 - If problem continues, then replace
Test UB - If problem continues, then replace
Problem: Bet One Lamp is Nonfunctional

Before removing the processor board, check the following areas:

✓ Use output test 45 to verify the problem
✓ Replace the lamp, and test
✓ Check wires and connectors for defects

If that doesn't work, try the following steps:

∴ Replace the processor board with a "known good" one
∴ If the processor board seems bad, verify in the tester
∴ If the processor board is good, then replace the mother board
∴ To repair the mother board, use this diagram to isolate the bad trace
∴ If the mother board and processor board are good, then use this diagram to test for wire continuity

wire continuity test
JP300-12 to JP3-92
JP300-11 to JP3-12

mother board test
JP5-22 to JP1-29B
JP5-12 to JP5-3

processor board test
Test C88(201E3) - if problem continues, then replace
Test R89 - if problem continues, then replace
Test UB - if problem continues, then replace
Problem: Cash Out Lamp is Nonfunctional

Before removing the processor board, check the following areas:

- Use output test 46 to verify the problem
- Replace the lamp, and test
- Check wires and connectors for defects

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board.
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JPP200-9 to JPP3-24
JPP200-11 to JPP3-12

MOTHER BOARD TEST
JPP3-24 to JP1-25A
JPP3-12 to JP6-3
JPP10-7 to JPP8-2 & JP1-31A, 32A, 32B

PROCESSOR BOARD TEST
Test Q2(L30163) - If problem continues, then replace
Test R7 - If problem continues, then replace
Test U8 - If problem continues, then replace.
Before removing the processor board, check the following areas:

- Use output test 31 to verify the problem
- Check wires and connectors for defects
- Replace candle change lamp and retest

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP140-2 to JP1-13
JP140-1 to JP1-1

MOTHER BOARD TEST
JP1-13 to JP1-29A
JP1-11 to JP9-3
JP9-2 to JP10-7

PROCESSOR BOARD TEST
Test C9 (J301413); if problem continues, then replace.
Test R98, if problem continues, then replace.
Test UB, if problem continues, then replace.
Before removing the processor board, check the following areas:

- Use output test 47 to verify the problem
- Replace the lamp, and test
- Check wires and connectors for defects
- Use this diagram to test for wire continuity

If that doesn’t work, try the following steps:

- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

**WIRE CONTINUITY TEST**

- JP205-7 to JP3-21
- JP300-11 to JP3-12

**MOTHER BOARD TEST**

- JP3-21 to JP1-28A
- JP3-12 to JP6-3

**PROCESSOR BOARD TEST**

- Test G7(L.201E3) - if problem continues, then replace
- Test RP7 - if problem continues, then replace
- Test UB - if problem continues, then replace
Problem: Payline 1 Lamp is Nonfunctional

Before removing the processor board, check the following areas:

✓ Use output test 36 to verify the problem
✓ Replace the lamp, and test
✓ Check wires and connectors for defects

If that doesn’t work, try the following steps:

☑ Replace the processor board with a "known good" one
☑ If the processor board seems bad, verify in the tester
☑ If the processor board is good, then replace the mother board
☑ To repair the mother board, use this diagram to isolate the bad trace
☑ If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP400-9 to JP1-2
JP400-3 to JP1-1

MOTHER BOARD TEST
JP1-2 to JP6-6
JP1-1 to JP6-3

PROCESSOR BOARD TEST
Test Q16 - If problem continues, then replace.
Test R10 (360 OHM) - If problem continues, then replace.
Test R9 (750 OHM) - If problem continues, then replace.
Test UB - If problem continues, then replace.
Problem: Payline 2 Lamp is Nonfunctional

Before removing the processor board, check the following areas:

- Use output test 37 to verify the problem
- Replace the lamp, and test
- Check wires and connectors for defects

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

Wire Continuity Test
JP400-8 to JP1-3
JP400-3 to JP1-1

Mother Board Test
JP1-3 to JP2-5A
JP1-1 to JP3-3

Processor Board
Test Q14 - if problem continues, then replace
Test RI8S - if problem continues, then replace
Test U9 - if problem continues, then replace
Problem: Payline 3 Lamp is Nonfunctional

Before removing the processor board, check the following areas:

✓ Check 7V, 8A fuse
✓ Use output test 20 to verify the problem
✓ Check wires and connectors for defects

If that doesn't work, try the following steps:

✓ If the lamp is nonfunctional, then replace the lamp and retest
✓ Replace the processor board with a "known good" one
✓ If the processor board seems bad, verify in the tester
✓ If the processor board is good, then replace the mother board
✓ To repair the mother board, use this diagram to isolate the bad trace
✓ If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
J/P400-7 to J/P41-4

MOTHER BOARD TEST
J/P1-4 to J/P2-4B

PROCESSOR BOARD TEST
Test Q13 (L2001L3) - if problem continues, then replace
Test RP6 - if problem continues, then replace
Test UB - if problem continues, then replace
Problem: Payline 4 Lamp is Nonfunctional

Before removing the processor board, check the following areas:

✓ Use output test 21 to verify the problem
✓ Check wires and connectors for defects

If that doesn't work, try the following steps:

○ If the lamp is nonfunctional, then replace the lamp and retest
○ Replace the processor board with a "known good" one
○ If the processor board seems bad, verify in the tester
○ If the processor board is good, then replace the mother board
○ To repair the mother board, use this diagram to isolate the bad trace
○ If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP400-8 to JP1-5

MOTHER BOARD TEST
JP1-5 to JP2-3B

PROCESSOR BOARD TEST
Test Q12 (L3601L3) - if problem continues, then replace
Test RP9 - if problem continues, then replace
Test U9 - if problem continues, then replace
Problem: Payline 5 Lamp is Nonfunctional

Before removing the processor board, check the following areas:

✓ Use output test 22 to verify the problem
✓ Check wires and connectors for defects

If that doesn’t work, try the following steps:

☐ If the lamp is nonfunctional, then replace the lamp and test
☐ Replace the processor board with a “known good” one
☐ If the processor board seems bad, verify in the tester
☐ If the processor board is good, then replace the mother board
☐ To repair the mother board, use this diagram to isolate the bad trace
☐ If the mother board and processor board are good, then use this diagram to test for wire continuity
Before removing the processor board, check the following areas:

- Use output test 23 to verify the problem
- Check wires and connectors for defects

If that doesn't work, try the following steps:

- If the lamp is nonfunctional, then replace the lamp and test
- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity
Problem: Payline 1 to 6 Lamps are Nonfunctional

Before removing the processor board, check the following areas:

- Use output test 20, 21, 22, 23, 36, and 37 to verify the problem
- Check (7 VAC 8A) fuse
- Check wires and connectors for defects

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP600-3 to JP1-1

MOTHER BOARD TEST
JP1-1 to JP8-3 & JP1-31A, 32A, 32B

PROCESSOR BOARD TEST
Test JP8 - if problem continues, then replace
Test U9 - if problem continues, then replace
Problem: All Lamps are Nonfunctional

Before removing the processor board, check the following areas:

✓ Use outputs test 20, 22, 23, 31, 36, 37, 41-46 to verify the problem
✓ Check (7VAC 8A) fuse

If that doesn't work, try the following steps:

○ Replace the processor board with a "known good" one
○ If the processor board seems bad, verify in the tester
○ If the processor board is good, replace the mother board
○ To repair the mother board, use this diagram to locate the bad trace
○ If the mother board and processor board are good, use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP140-1 to JP1-1
MOTHER BOARD TEST
JP1-1 to JP8-3
JP10-7 to JP1-31A, then 32A, then 32B and then JP8-2
PROCESSOR BOARD TEST
Test JP8 - if problem continues, then replace
Test U8 & U9 - if problem continues, then replace

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Problem: Bill Acceptor is Not Enabled – 24 VAC Output

Before removing the processor board, check the following areas:

✓ Check 24V-6A fuse
✓ Use output test 26 to verify the problem
✓ Check wires and connectors for defects
✓ See note below

If that doesn't work, try the following steps:

❖ Replace the processor board with a “known good” one
❖ If the processor board seems bad, verify in the tester
❖ If the processor board is good, then replace the mother board
❖ To repair the mother board, use this diagram to isolate the bad trace
❖ If the mother board and processor board are good, then use this diagram to test for wire continuity

Note:
Denomination must be set to a value other than 0. In credit mode, the credits accumulated must be less than the maximum coin-in amount.
1. "Hot" machine (players get electrical shock) – Check from house outlet to power strip to machine, with "outlet polarity checker" for incorrect wiring.

2. Machine "blacked out" (no functions)
   a. If 110VAC 6A fuse keeps blowing, disconnect the hopper SSR and J/P208 (fluorescent connection) to isolate to main transformer and back.
   b. Replace the fuse (always use fast blow fuses with the correct rating).
   c. If the fuse does not blow, reconnect J/P208. This will indicate whether the problem is in the fluorescent circuit or in the SSR.

3. 24VAC fuse or 7VAC fuse constantly blows
   a. Remove the processor board and disconnect all mother board connections, then reseat the processor board.
   b. Replace the fuse (always use fast-blow fuses with the correct rating).
   c. If the fuse stills blows, then remove and replace the processor board to determine if the processor board or mother board is bad.
   d. If the original processor board and mother board did not cause the fuse to blow, then reconnect each connector one by one until the fuse blows.
   e. Trace the harnessing from the last connector to its input or output.
   f. Replace the load, first then check wiring insulation for breaks.

4. Be aware that wires must be fully seated in the terminal block (commoning blocks).

5. Be aware that a bad power strip or bad power cord will result in power problems.

6. To ensure proper current and voltage for each machine, connect no more than five machines per 20 Amp circuit breaker.

7. A potential hazard exists when a circuit is overloaded. From ground to neutral (at the outlet or across two machines) should not exceed 3VAC.

8. A device connected to the accessory outlet that draws over 2 amps can degrade the filter.
The AC power is routed from the floor through the machine drop area to the lower module. The AC power is then connected by plug to a filter (p/n 272.006 0x). The earth ground is delivered by the AC cord and connects to the lower module for chassis ground. This sets the machine frame or chassis at earth ground.

The 110VAC goes directly to the auxiliary receptacle, after which it meets a DPST toggle switch, then it is fused at F3 (110V 6A). It serves three separate functions: 110VAC is delivered to the primary of the main transformer; 110VAC is delivered to all fluorescent lamps; and, 110VAC is delivered to the hopper SSR.

The secondary of the main transformer will provide 12VAC center-tapped for the processor board tray transformer, 7VAC for incandescent lamps and 8VAC for holding reels in the idle state.
TRAY TRANSFORMER

VOLTAGE STEP-OVER MOTOR (5) HIGH 7.0 LOW -- APPROX 15V

TO TEST THE TWO DIFFERENT VOLTAGES
GO INTO OUTPUT TEST 48 AND PLACE
THE + LEAD OF YOUR METER ON ANODE OF
REEL, THE - LEAD OF YOUR METER ON
THE INVERSE OF GND AND MEASURE
THE VOLTAGE. IT SHOULD BE APPROX
7.0 VDC THEN
PRESS THE SPIN REEL BUTTON AND THE
READING SHOULD CHANGE TO APPROX
11.5 VDC = 15VDC

GND
IS ISOLATED LOGIC GROUND

BGND
IS CHASSIS GROUND

+5 (VCC) +5 (VCC) +5 (VCC)
IS USED TO POWER ALL ICS AND
OTHER DEVICES INSIDE THE OPTO
ISOLATION

+Vb +Vb +Vb
IS USED TO POWER THE OPTOS AND
OTHER DEVICES OUTSIDE THE OPTO
ISOLATION

Vun +Vun +Vun
IS USED TO POWER VARIOUS OPTOS
AND THE EQUINE AMPLIFIER WHERE
A HIGHER VOLTAGE IS REQUIRED

+Vs +Vs +Vs
IS A DUAL POWER SUPPLY THE LOW
VOLTAGE IS USED TO HOLD THE
REEL WHILE THEY ARE IS AT IDLE
THE HIGH-VOLTAGE SUPPLY IS
ACCELERATING, SPINNING, AND
DECELERATING.
S-Plus Serial Clock Signals
Tracing Inputs

Each input problem is taken individually and traced to its “opto-isolation” on the processor board. Opto-isolation is the board’s defense against static electricity, noise, or any unwanted electrical feedback. The majority of board problems are I/O and voltage problems. These problems usually occur between opto-isolation and the board connectors. The vast majority of input problems are not board problems. Suspected board problems should be isolated to the board, on a tester if possible, before any repair is attempted.

Start With the Problem

The simplest means of resolving machine and board repairs is to start with the problem and then try to isolate the cause. Treat each potential input problem individually. Trace the problem from the exterior of the machine to the processor board, and the point of opto-isolation.

The technician should verify every problem using the inputs test. The technician can then reference each input in question in this manual.

When using the diagram provided with each input problem, the following items should be kept in mind:

- Each input when activated sends a signal through the wiring and connectors to the mother board.
- The motherboard connects the signal via a trace to the processor board.
- The processor board has an input protection resistor pack with pull-up resistors tied to a Vb, followed by a parallel/serial shift register, which is then followed by buffers and opto-isolation.
- The input when activated presents a logic low inward. This input signal either goes directly to opto-isolation or in the case of all the player panel switches and self test mode, the input goes through a diode matrix then to opto-isolation.

Inputs Test

The message SELF-TEST INPUTS appears at the top of the video screen. Below it are the names of the available inputs with either a “0” or a “1” in front of each input. These numbers represent the present logic level of the input and are used to troubleshoot specific input devices. Typically, a “0” indicates the circuit or switch is in an open state and a “1” indicates the circuit or switch is closed.

Activating an input changes its logic level from 0 to 1 or 1 to 0 when the input is working properly. If no change occurs as the switch is activated, the switch or its wiring may be faulty, or a problem may exist on the processor board or with the game program IC.

To activate a switch input, press that particular switch. To activate inputs that are not switches, simply operate the part as it is used on the machine. For example, a bill acceptor is activated by inserting a bill into the acceptor.

![Self-Test Inputs](image)

Typical inputs Test (Poker).
Problem: Self Test Switch is Nonfunctional (Can’t Enter Self Test Mode)

Before removing the processor board, check the following areas:

✓ Check wires and connectors for defects
✓ Check for ~8 to 10 VDC across 2 leads of the self test switch
✓ Press the self test switch – measure the voltage (voltage should be 0 VDC)
✓ Replace the self test switch, and test

If that doesn’t work, try the following steps:

✓ Replace the processor board with a “known good” one
✓ If the processor board seems bad, verify in the tester
✓ If the processor board is good, then replace the mother board
✓ To repair the mother board, use this diagram to isolate the bad trace
✓ If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
Ground lead to JPS-14
Normally open lead to JPS-13

MOTHER BOARD CONTINUITY TEST
JPS-14 to JP13-7 & JP2-30A
JPS-13 to JP1-7B

PROCESSOR BOARD TEST
Check Vb at U1 (negative lead on B ground use positive lead to check pin 1 for Vb (~8-0VDC))
Test U1 - if problem continues, then replace.
Test RPS - if problem continues, then replace.
Problem: Hold 1 Switch is Nonfunctional

Before removing the processor board, check the following areas:

✓ Verify the problem by checking the inputs test in the self test mode
✓ Check to see if the button assembly is clean, and has no broken or missing parts
✓ If there is a faulty microswitch, replace it
✓ If all the hold switches are nonfunctional, replace the self test switch
✓ If the microswitch is wired incorrectly, reconnect by checking another machine of the same type
✓ Connect one meter lead to the normally open leg of the switch and connect the other meter lead to the chassis ground (B gnd), then measure for ~8 to 10 VDC
✓ Activate the switch— the voltage should drop to zero volts
✓ Test for continuity from H/C1 common to the normally closed leg of H/C5
✓ If the switch measures open, then measure the next switch inward until a low resistance is measured

If that doesn't work, try the following steps:

○ Replace the processor board with a “known good” one
○ If the processor board is good, then replace the mother board
○ To repair the mother board, use this diagram to isolate the bad trace
○ If the mother board and processor board are good, then use this diagram to test for wire continuity
Problem: Hold 2 Switch is Nonfunctional

Before removing the processor board, check the following areas:

- Verify the problem by checking the input test in the self-test mode
- Check to see if the button assembly is clean and has no broken or missing parts
- If there is a faulty microswitch, replace it
- If hold switches 2 through 5 are nonfunctional, replace hold switch one first
- If the microswitch is wired incorrectly, reconnect by checking another machine of the same type
- Connect one meter lead to the normally open leg of the switch and connect the other meter lead to the chassis ground (B ground), then measure for ~8 to 10 VDC
- Activate the switch; the voltage should drop to zero volts
- Test for continuity from H/C2 common to the normally closed leg of H/C5
- If the switch measures open, then measure the next switch inward until a low resistance is measured

If that doesn’t work, try the following steps:

- Replace the processor board with a “known good” one
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity
Problem: Hold 3 Switch is Nonfunctional

Before removing the processor board, check the following areas:

- Verify the problem by checking the input test in the self test mode
- Check to see if the button assembly is clean and has no broken or missing parts
- If there is a faulty microswitch, replace it
- If hold switches 3 through 5 are nonfunctional, replace hold switch 2 first
- If the microswitch is wired incorrectly, reconnect by checking another machine of the same type
- Connect one meter lead to the normally open leg of the switch and connect the other meter lead to the chassis ground (B gnd), then measure for ~8 to 10 VDC
- Activate the switch— the voltage should drop to zero volts
- Test for continuity from H/C3 common to the normally closed leg of H/C5
- If the switch measures open, then measure the next switch inward until a low resistance is measured

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
Common lead to JPS-14
Normally open lead to JP3-3

MOTHER BOARD CONTINUITY TEST
JPS-14 to JP13-7
JP3-3 to JP1-8A

PROCESSOR BOARD TEST
Check Vb at U1 (negative lead on B ground use positive lead to check pin 1, 2, 4 for Vb (~6-9VDC))
Check Vl at U2 (negative lead on B gnd and positive lead on pin 1)
Test U1 & U2
Test CR1 & CR3
Test RP3 or RP4 - if problem continues, then replace.
Problem: Hold 4 Switch is Nonfunctional

Before removing the processor board, check the following areas:

✔ Verify the problem by checking the input test in the self test mode
✔ Check to see if the button assembly is clean and has no broken or missing parts
✔ If there is a faulty microswitch, replace it
✔ If hold switches 4 and 5 are nonfunctional, replace hold switch 3 first
✔ If the microswitch is wired incorrectly, reconnect by checking another machine of the same type
✔ Connect one meter lead to the normally open leg of the switch and connect the other meter lead to the chassis ground (B gnd), then measure for -8 to 10 VDC
✔ Activate the switch; the voltage should drop to zero volts
✔ Test for continuity from H/C4 common to the normally closed leg of H/C5

If that doesn't work, try the following steps:

♀ Replace the processor board with a "known good" one
♀ If the processor board seems bad, verify in the tester
♀ If the processor board is good, then replace the mother board
♀ To repair the mother board, use this diagram to isolate the bad trace
♀ If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
Common lead to JP5-14
NORMALLY open lead to JP3-4

MOTHER BOARD CONTINUITY TEST
JP5-14 to JP3-7
JP3-4 to JP1-10 A

PROCESSOR BOARD TEST
Check Vb at U1 & 2 (negative lead on B ground use, positive lead to check pins 1 & 2 for Vb (-8-9VDC))
Test U1 & U2
Test CR10 & CR11
Test RPS or RP4, if problem continues, then replace.
Problem: Hold 5 Switch is Nonfunctional

Before removing the processor board, check the following areas:

- Verify the problem by checking the input test in the self test mode
- Check to see if the button assembly is clean and has no broken or missing parts
- If there is a faulty microswitch, replace it
- If hold switch 5 is nonfunctional, replace hold switch 4 first
- If the microswitch is wired incorrectly, reconnect by checking another machine of the same type
- Connect one meter lead to the normally open leg of the switch and connect the other meter lead to the chassis ground (E gnd), then measure for ~8 to 10 VDC
- Activate the switch— the voltage should drop to zero volts
- If voltage is missing, use this diagram to test for wire continuity

If that doesn’t work, try the following steps:

- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
Common lead to JP5-14
Normally open lead to JP3-5

MOTHER BOARD CONTINUITY TEST
JP5-14 to JP1-7
JP3-5 to JP1-9B

PROCESSOR BOARD TEST
Check Vb at U1 & 2 (negative lead on B ground use positive lead to check pin 1 & 4 for Vb (~8-9VDC))
Check Vb at U2 (negative lead on B gnd and positive lead on pin 1)
Test U1 & U2
Test CR1's 2, 4, and 9 (1N4148's)
Test RP3 or RP4 - if problem continues, then replace.
Problem: Deal/Draw Switch is Nonfunctional

Before removing the processor board, check the following areas:

- Verify the problem by checking the input test in the self test mode
- Check to see if the button assembly is clean and has no broken or missing parts
- Connect one meter lead to the normally open leg of the switch and the other meter lead to the chassis ground (B gnd), then measure for -8 to 10 VDC
- Activate the switch—the voltage should drop to zero volts
- Test for continuity from Deal/Draw switch common to the normally closed leg of the Change switch
- If the switch measures open, then measure the next switch inward until a low resistance is measured
- If the voltage seems bad, then use this diagram to test for wire continuity

If that doesn't work, try the following steps:

- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
Common lead to JP3-38
Normally open lead to JP3-6

MOTHER BOARD CONTINUITY TEST
JP3-38 to JP2-30A (note intermediate connections)
JP3-6 to JP1-10B

PROCESSOR BOARD TEST
Check Vb at U2. (negative lead on B ground use positive lead to check pin 4 for Vb (-8-9VDC))
Test U2
Test RP4—if problem continues, then replace.
Before removing the processor board, check the following areas:

- Verify the problem by checking the input test in the self test mode.
- If the other switches are nonfunctional, replace the Deal/Draw switch first.
- Connect one meter lead to the normally open leg of the switch and connect the other meter lead to the chassis ground (B gnd), then measure for ~3 to 10 VDC.
- Activate the switch—the voltage should drop to zero volts.
- Test for continuity from Bet Max switch common to the normally closed leg of the Change switch.
- If the switch measures open, then measure the next switch inward until a low resistance is measured.
- If the voltage seems bad, then use this diagram to test for wire continuity.

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one.
- If the processor board seems bad, verify in the tester.
- If the processor board is good, then replace the mother board.
- To repair the mother board, use this diagram to isolate the bad trace.
- If the mother board and processor board are good, then use this diagram to test for wire continuity.

Wire Continuity Test:
- Common lead to JP3-38
- Normally open lead to JP5-19

Mother Board Continuity Test:
- JP5-36 to JP2-30A (note intermidiate connections)
- JP5-19 to JP1-11A

Processor Board Test:
- Check Vb at U2 (negative lead on B ground use positive lead to check pin 4 for Vb (~8-9VDC)).
- Test U2
- Test HP4—If problem continues, then replace.
Problem: Bet 1 Switch is Nonfunctional

Before removing the processor board, check the following areas:

☑ Verify the problem by checking the input test in the self test mode
☑ Check to see if the button assembly is clean with no broken or missing parts
☑ If the other switches are nonfunctional, replace the Bet Max switch first
☑ Connect one meter lead to the normally open leg of the switch and connect the other meter lead to the chassis ground (B gnd), then measure for -8 to 10 VDC
☑ Activate the switch—the voltage should drop to zero volts
☑ Test for continuity from Bet One switch common to the normally closed leg of the Change switch
☑ If the switch measures open, then measure the next switch inward until a low resistance is measured

If that doesn’t work, try the following steps:

☐ Replace the processor board with a “known good” one
☐ If the processor board seems bad, verify in the tester
☐ If the processor board is good, then replace the motherboard
☐ To repair the motherboard, use this diagram to isolate the bad trace
☐ If the motherboard and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
Common lead to JP3-38
Normally open lead to JP5-17

MOTHER BOARD CONTINUITY TEST
JP3-38 to JP2-30A (note intermediate connections)
JP5-17 to JP1-11B

PROCESSOR BOARD TEST
Check Vb at U2 (negative lead on B ground
use positive lead to check pin 8 for Vb
(-8-0VDC))
Test U2
Test U2 - if problem continues, then replace
Problem: Cashout Switch is Nonfunctional

Before removing the processor board, check the following areas:

- Verify the problem by checking the input test in the self test mode.
- Check to see if the button assembly is clean and with no broken or missing parts.
- If the other switches are nonfunctional, replace the Bet One switch first.
- Connect one meter lead to the normally open leg of the switch and connect the other meter lead to the chassis ground (B gnd), then measure for ~8 to 10 VDC.
- Activate the switch—the voltage should drop to zero volts.
- Test for continuity from Cash Out switch common to the normally closed leg of the Change switch.
- If the switch measures open, then measure the next switch inward until a low resistance is measured.

If that doesn’t work, try the following steps:

- Replace the processor board with a “known good” one.
- If the processor board seems bad, verify in the tester.
- If the processor board is good, then replace the mother board.
- To repair the mother board, use this diagram to isolate the bad trace.
- If the mother board and processor board are good, then use this diagram to test for wire continuity.

WIRE CONTINUITY TEST
Common lead to JPS-36
Normandy open lead to JPS-19

MOTHER BOARD CONTINUITY TEST
JPS-36 to JPS-30A (note intermediate connections)
JPS-19 to JPS-135

PROCESSOR BOARD TEST
Check Vb at U2 (negative lead on B ground
use positive lead to check pin 4 & 8 for Vb
(4.0-4.5VDC))
Test U2
Test CR12 & CR15 (1N4148)
Test RP4—If problem continues, then replace
Problem: Change Switch is Nonfunctional

Before removing the processor board, check the following areas:

- Verify the problem by checking the input test in the self test mode
- Check to see if the button assembly is clean and has no broken or missing parts
- If the other switches are nonfunctional, replace the Cashout switch first
- Connect one meter lead to the normally open leg of the switch and connect the other meter lead to the chassis ground (B gnd), then measure for ~8 to 10 VDC
- Activate the switch— the voltage should drop to zero volts
- If the switch measures open, then measure the next switch inward until a low resistance is measured.
- If the voltage seems bad, then use this diagram to test for wire continuity

If that doesn't work, try the following steps:

- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity
Problem: Jackpot Reset Key is Nonfunctional (Can't Reset a Jackpot or Access Soft Meters)

Before removing the processor board, check the following areas:

- Verify the problem in the input test
- Check wire and connectors for defects
- Check for −8 to 10 VDC across 2 leads to the jackpot reset key
- Replace jackpot reset key, and test

If that doesn't work, try the following steps:

- If there is no voltage, use this diagram below to test for wire continuity
- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP19-7 to JP13-6
No side to JP13-15
Common side to JP13-16

MOTHER BOARD CONTINUITY TEST
JP13-15 to JP1-7A
JP13-16 to JP13-7 & JP2-30A

PROCESSOR BOARD TEST
Check Vb at U1 (negative lead on B ground
use positive lead to check pin 4 for Vb
(−8-9VDC))
Test U1 - if problem continues, then replace.
Test RP3 - if problem continues, then replace.
Problem: Constant "Door Open" State (Suspect Bad LED)

Before removing the processor board, check the following areas:

- Check self test inputs to verify problem (door open)
- Check the bill acceptor for a door open signal
- Check optic alignment (door LED to phototransistor on chassis)
- Visually inspect wires and connectors
- Use a flashlight to activate the phototransistor, if it works replace the LED
- If the phototransistor is not activated by the flashlight, then replace it
- Disconnect door LED at J/P170 and test for ~5VDC
- Disconnect the phototransistor chassis at J/P171 and test for ~8 to 9VDC

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity
Problem: Coin-In Timeout (Optic Sensors Blocked for Over 100 msec)

Before removing the processor board, check the following areas:

- Use input test 11 & 12 to verify problems
- Check for any obstruction in the ABC optics
- If the diverter paddle moves slowly, then clean and repair it
- Unplug the 10-pin plug at J750, to measure pins 1, 3, & 4 for ~8 VDC and Vb at pin 8 (ground lead on chassis)
- Check pin 7 for ground (green wire)
- If the voltage is good, replace ABC optics
- If the voltage is missing, then check harness wiring and plugs

If that doesn’t work, try the following steps:

- Change the ABC optics, and test
- Replace the processor board, and test
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram below to isolate the bad trace
- If the processor board and mother board is good, then go to the machine and check the wire continuity using the wiring diagram provided on this page

WIRE CONTINUITY TEST
LED Side: J750-6 to J751-25
LED Side: J750-7 to J751-23
DET Side: J750-4 to J751-20 (A Optic)
DET Side: J750-3 to J751-21 (B Optic)
DET Side: J750-1 to J751-22

MOTHER BOARD CONTINUITY TEST
JP3-20 to JP1-20
JP3-21 to JP1-5A
JP3-22 to JP1-4B
JP3-23 to JP1-6B
JP3-25 to JP1-27A

PROCESSOR BOARD TEST
Check Vb at U10 (negative lead on B ground use positive lead to check pins 1, 4, & 5 for Vb (~8 VDC))
Test U10 - if problem continues, then replace.
Test RP1 - if problem continues, then replace.

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Problem: Coin-Out Timeout (Coin-Out Optics Blocked for Over .7 sec)

Before removing the processor board, check the following areas:

✓ Check the self test inputs to verify the problem (coin-out)
✓ Check for obstructions, misalignments, or any physical reason for the coins to pass slowly through the optics
✓ Check optics and optic wires for damage
✓ With elevator hopper, coin out optics and mechanical flag may need adjustment or spring may need replacement
✓ Verify ground lead is secure to chassis and the hopper Beirut plug is seated firmly
✓ Visually inspect the wires and connectors
✓ Perform the hopper self test; if problem recurs replace the optics
✓ Check hopper plug for 8 to 9 VDC at J/P19-8 and J/P19-10 to J/P19-9

If that doesn't work, try the following steps:

rounded Replace the processor board with a “known good” one
rounded If the processor board seems bad, verify in the tester
rounded If the processor board is good, then replace the mother board
rounded To repair the mother board, use this diagram to isolate the bad trace
rounded If the mother board and processor board are good, then use this diagram to test for wire continuity
Problem: Extra Coin Paid Out (Optic Senses Extra Coin or Payout)

Before removing the processor board, check the following areas:

- Perform hopper test in self test mode, if problem recurs replace optics
- Check hopper brake and brake spring
- With the escalator hopper, check the coin-out optics and mechanical flag to see if adjustment or spring may need replacement
- Check hopper pinwheel and wiper for smooth operation
- Check optic and optic wires for damage
- Verify optic ground lead is secured to chassis and hopper Beau plug is seated firmly

If that doesn't work, try the following steps:

- Check hopper plug for –8 to 9 VDC at J/P19-8 and J/P19-10 to J/P19-9
- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
(B ground should be at JP19-9
LED Side: JP19-10 to JP13-10
DET Side: JP19-8 to JP19-9)

MOTHER BOARD CONTINUITY TEST
JP13-8 to JP1-4A
JP13-10 to JP1-27A

PROCESSOR BOARD TEST
Check Vb at U10 (negative lead on B ground use positive lead to check pin 8 for Vb (-8 to 9VDC))
Test U10 - If problem continues, then replace. Test RP1 - If problem continues, then replace.
Problem: Empty Hopper Message (Hopper Optic Doesn't Recognize a Coin For 7–8 sec)

Before removing the processor board, check the following areas:

- Check for empty or low hopper
- Check to see if hopper is jammed
- Check hopper motor, gearbox, and roll pin
- Visually inspect wires and connectors to hopper plug
- If coins are jammed in the esculator hopper, remove the bent coin(s)
- If coins are doubled-up consider replacing the pinwheel, entry plate and/or pinwheel shims
- Perform the hopper test in the self test mode, observe hopper action to isolate problem
- Verify that coins are going through the hopper optics to the coin tray, and counted correctly

If that doesn't work, try the following steps:

- Check the Vb at the hopper plug J/P19-8 and J/P19-10 to J/P19-9
- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity
Problem: Hopper Overflow

Before removing the processor board, check the following areas:

✓ Check the hopper probe function in the self test inputs to verify the problem
✓ Check for coins bridging the hopper probe
✓ Check the diverter function in the output test
✓ Check wire and connectors for defects
✓ Use this diagram to test for wire continuity

If that doesn’t work, try the following steps:

♂ Replace the processor board with a “known good” one
♂ If the processor board seems bad, verify in the tester
♂ If the processor board is good, then replace the mother board
♂ To repair the mother board, use this diagram to isolate the bad trace
♂ If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP19-7 to JP13-8

MOTHER BOARD CONTINUITY TEST
JP19-9 to JP1-69

PROCESSOR BOARD TEST
Check Vb at U1 (negative lead on B ground use positive lead to check pin 8 for Vb (≈9VDC))
Test U1 - if problem continues, then replace,
Test R10 - if problem continues, then replace.
Problem: Bill Validator Won't Accept Bills (No Vend Signal)

Before removing the processor board, check the following areas:

✔ Verify the problem by checking the input test in self test mode
✔ Visually inspect wires and connectors
✔ Verify that the validator is enabled – see output test

If that doesn't work, try the following steps:

⊙ Replace the validator with a "known good" one
⊙ Replace the processor board with a "known good" one
⊙ If the processor board seems bad, verify in the tester
⊙ If the processor board is good, then replace the mother board
⊙ To repair the mother board, use this diagram to isolate the bad trace
⊙ If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP195-1 to JP8-2
JP195-2 to JP8-4

MOTHER BOARD CONTINUITY TEST
JP8-2 to JP1-12A
JP8-4 to JP13-7 & JP2-30A

PROCESSOR BOARD TEST
Check Vb at U2 (negative lead on ground use positive lead to check pin 4, 5, 8 for Vb (~GND))
Test U2
Test CR15, CR16, & CR18 (1N4148)
Test RP4 – if problem continues, then replace
Start With the Problem

The simplest means of treating machine and board repairs is to start with the obvious problem and then try to isolate the cause. Treat each potential output problem individually, and trace it from the exterior of the machine to one of the processor boards, through the point of opto-isolation. Opto-isolation is a defense against static electricity, noise, or any unwanted electrical feedback.

The technician should verify each problem in the output test. The technician can then reference each output in question in this manual.

When using the diagram provided with each output problem, the following items should be kept in mind:

- Each output can be activated by a signal through the wiring and connectors from the mother board.
- The mother board connects the signal from the processor board (processor board connects to the mother board at J/P1 and J/P2).
- The processor board typically has a driver (e.g. triac) that connects to an output pin on the parallel side of the shift register.

Outputs Section of the Processor Board

The outputs section contains four 8-bit output latches (U33, U35, U37, and U39). Each output latch requires a steady low on its pin 1 and a clock pulse on pin 11. With these two conditions satisfied, the output latches can update the outputs from the data-bus.

The output side of the output latches is a buffer and current limiting register for each output bit and then opto-isolation. From the point of opto-isolation on, is the driver area (the area most susceptible to damage). The majority of drivers are triacs (AC switches). Two output drivers are NPN transistors and digital switches (jackpot out and door open).

Outputs Test

The message SELF-TEST OUTPUTS appears at the top of the video screen. Below it are the names of the available outputs. An arrow-shaped cursor, located to the immediate left of the output names, indicates which output is under test.

Consult the on-screen instructions and press the indicated switch on the player panel to move the cursor from one output to the next.

Turn the reset key to activate most outputs. Most tests illuminate one or more player panel switches to advance the cursor. The lockout test activates the LED indicator on the coin comparator and the sound effects test produces a tone from the speaker. To activate the bill acceptor, insert a dollar bill.
Problem: Coin-In Meter is Nonfunctional

Before removing the processor board, check the following areas:

- Use output test to verify the problem
- Check wires and connectors for defects
- Verify meter lead is seated in position #2 of terminal block
- Replace meter, and test

If that doesn't work, try the following steps:

- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP14S-2 to JP7-4
JP14S-1 to JP7-1

MOTHER BOARD CONTINUITY TEST
JP7-4 to JP2S-4A
JP7-1 to JP11-6
JP11-5 to JP2S-2B

PROCESSOR BOARD TEST
Check from K3 to edge for burned trace
Test K3 (SPI210X) - if problem continues, then replace.
Test C2 - if driver ever turns on by itself
Problem: Coin-Out Meter is Nonfunctional

Before removing the processor board, check the following areas:

- Use output test to verify the problem
- Check wires and connectors for defects
- Verify meter lead is seated in position #3 of terminal block
- Replace meter, and test

If that doesn’t work, try the following steps:

- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

Wire Continuity Test
JP145-3 to JP7-6
JP145-1 to JP7-1

Mother Board Continuity Test
JP7-6 to JP2-4B
JP7-1 to JP11-6

Processor Board Test
Check from K2 to edge for burned trace
Test K2 (BP1210X) - if problem continues, then replace
Test G7 - if driver ever turns on by itself
Problem: Coin-Drop Meter is Nonfunctional

Before removing the processor board, check the following areas:

- Use output test to verify the problem
- Check wires and connectors for defects
- Verify meter lead is seated in position #4 of terminal block
- Replace meter, and retest

If that doesn’t work, try the following steps:

- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

* WIRE CONTINUITY TEST
  JP145-4 to JP7-5
  JP145-1 to JP7-1

* MOTHER BOARD CONTINUITY TEST
  JP7-5 to JP2-5A
  JP7-1 to JP11-6

* PROCESSOR BOARD TEST
  Check from K5 to edge for burned trace
  Test K3 (SP121DX) - If problem continues, then replace.
  Test C4 - If driver ever turns on by itself

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Problem: Jackpot Meter is Nonfunctional

Before removing the processor board, check the following areas:

✓ Use output test to verify the problem
✓ Check wires and connectors for defects
✓ Verify meter lead is seated in position #5 of terminal block
✓ Replace meter, and test

If that doesn't work, try the following steps:

∞ Replace the processor board with a "known good" one
∞ If the processor board seems bad, verify in the tester
∞ If the processor board is good, then replace the mother board
∞ To repair the mother board, use this diagram to isolate the bad trace
∞ If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP1:45-5 to JP7-1
JP1:45-1 to JP7-1

MOTHER BOARD CONTINUITY TEST
JP7-2 to JP2-3B
JP7-1 to JP11-5

PROCESSOR BOARD TEST
Check from K4 to edge for burned trace
Test K4 (SP121DX) - if problem continues, then replace.
Test C1 - if driver ever turns on by itself
Problem: Game Meter is Nonfunctional

Before removing the processor board, check the following areas:

- Use the output test to verify the problem
- Verify meter lead is seated in position #6 of in terminal block
- Check wires and connectors for defects
- Replace the meter, and test

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the motherboard
- To repair the motherboard, use this diagram to isolate the bad trace
- If the motherboard and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP146-S to JP7-7

MOTHER BOARD CONTINUITY TEST
JP7-7 TO JP2-2A

PROCESSOR BOARD CONTINUITY TEST
Check from K1 to edge for burned trace
Test K1 (JP21DX) - If problem continues then replace
Test CB - (If driver ever turns on by itself) if problem continues then replace
Problem: All Meters are Nonfunctional

Before removing the processor board, check the following areas:

- Check 24V 5A fuse
- Check terminal block to see if #1 wire is seated firmly in place
- Check connector and wire from J/P145-1 to J/P7-1

If that doesn’t work, try the following steps:

- Remove mother board, and test J/P7-1 to J/P11-6 and J/P11-5 to J/P2-2B
- If D4 stays “open”, replace it (current suppressor 1.65A, RXE110)
Problem: Bell is Nonfunctional

Before removing the processor board, check the following areas:

- Use output test to verify problem
- Check wires and connectors for defects
- Verify that J/P14 is connected at the rear of the mother board
- Replace the bell, and test

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
J/P135-1 to J/P14-1
J/P135-2 to J/P14-2

MOTHER BOARD CONTINUITY TEST
J/P14-1 to J/P11-8
J/P11-5 to J/P14-2
Replace D3 if it stays "open"
D3 is a current suppressor, 1.65A RXE

PROCESSOR BOARD TEST
Check from Q11 to edge for burned trace
Test Q11 (MAC3030), and test
Test U5 (MAC3031), and test
R19 and C10 constitute a "snubber circuit" protecting Q11 from false triggering
Problem: Diverter is Nonfunctional

Before removing the processor board, check the following areas:

✓ Use output test to verify problem
✓ Check the 24 VAC fuse
✓ Replace the diverter coil, and test

If that doesn't work, try the following steps:

➢ Replace the processor board with a "known good" one
➢ If the processor board seems bad, verify in the tester
➢ If the processor board is good, then replace the mother board
➢ To repair the mother board, use this diagram to isolate the bad trace
➢ If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP9-2 to JP3-29
JP190-1 to JP3-27

MOTHER BOARD CONTINUITY TEST
JP3-27 to JP4-24
JP3-29 to JP11-6
JP11-3 to JP1-22A & 22B
Replace D2 if it "stays" open
(D2 is a current suppressor 1.85A RKE)

PROCESSOR BOARD TEST
Check from Q10 to edge (JP2-159 & JP2-17B) for burned trace
Test Q10(MAC3020) - if problem continues, then replace.
Test U94(MAC3001) - if problem continues, then replace.
Test F1, current suppressor .075A (RXE 050)
Test R23, R24 & R25
Problem: Lockout On Comparator is Nonfunctional

Before removing the processor board, check the following areas:

- Use output test to verify problem
- Check the 24VAC fuse
- Replace the comparator, and test

If that doesn't work, try the following steps:

- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP1-2 to JP3-29
JP3-1 to JP3-21

MOTHER BOARD CONTINUITY TEST
JP3-26 to JP1-28B
JP1-28 to JP1-16
JP1-11 to JP1-22A & 22B
Remove and replace D2 if it stays "open"
D2 is a current suppressor (1.5A RXE)

PROCESSOR BOARD TEST
Check from Q9 to edge (JP2-15B & JP2-17B) for burned trace
Replace Q3(MAC3166) - if problem continues, then replace.
Replace U17(MAC3013) - if problem continues, then replace.
R11 and C9 constitute a “snubber circuit” protecting Q11 from false triggering.
Test R21 & R22.
Problem: Hopper Won't Turn On

Before removing the processor board, check the following areas:

- Verify that the wires to the hopper motor are connected
- Verify that the roll-pin is good
- Test for 110VAC across J/P19-11 & 12
- If 110VAC is missing, then trace back for a broken connection
- If 110VAC is good, then replace the hopper SSR and test
- Check for obstructions in the hopper
- Use another hopper to determine if the motor seems bad

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity
Problem: Runaway Hopper

Before removing the processor board, check the following areas:

✓ If the machine is operating correctly, verify the operation of the hopper in the outputs test
✓ Remove the processor board while activating the hopper
✓ If the hopper stops, replace the processor board
✓ If hopper continues to run without the processor board, replace SSR

If that doesn't work, try the following steps:

☞ Replace the processor board with a "known good" one
☞ If the processor board seems bad, verify in the tester
☞ If the processor board is good, then replace the mother board
☞ To repair the mother board, use this diagram to isolate the bad trace

MOTHER BOARD CONTINUITY TEST
JP13-6 to JP1-2SA
JP13-5 to JP1-2SA

PROCESSOR BOARD TEST
Test Q16, Q17
Test R35, R37, R38, R39
Test U6
Before removing the processor board, check the following areas:

- Verify optic alignment
- Use input test to verify if the phototransistor is good (use a flashlight to simulate a LED)
- Verify that the bill validator door switch is closed
- Test for –8 to 10 VDC across J/P170
- If the door LED is nonfunctional, then remove and replace LED

If that doesn’t work, try the following steps:

- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
J/P170-1 to J/P5-5
J/P170-2 to J/P5-6

MOTHER BOARD CONTINUITY TEST
J/P5-6 to J/P11-6, J/P13-7 & J/P5-30A
J/P5-6 to J/P2-22A & J/P2-27A
J/P11-5 to J/P2-30A

PROCESSOR BOARD TEST
Measure Vb at anode of CR19
Test Q6(2N3904) and check R32(10K Ohm), if problem continues, then replace.
Check CR19
Test U6, if problem continues, then replace.
Problem: SDS Not Receiving Jackpot Signals

Before removing the processor board, check the following areas:

✓ Use output test to verify the problem

If that doesn’t work, try the following steps:

➢ Replace the processor board with a “known good” one
➢ If the processor board seems bad, verify in the tester
➢ If the processor board is good, then replace the mother board
➢ To repair the mother board, use this diagram to isolate the bad trace
➢ If the mother board and processor board are good, then use this diagram to test for wire continuity
Problem: Hold Lamp 1 is Nonfunctional

Before removing the processor board, check the following areas:

✔ Use output test to verify the problem
✔ Verify that the lamp is seated firmly in the socket
✔ Replace the lamp, and test
✔ Check wires and connectors for defects

If that doesn’t work, try the following steps:

☉ Replace the processor board with a “known good” one
☉ If the processor board seems bad, verify in the tester
☉ If the processor board is good, then replace the mother board
☉ To repair the mother board, use this diagram to isolate the bad trace
☉ If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP5-28 to JP5-29

MOTHER BOARD CONTINUITY TEST
JP5-28 to JP1-18B
JP5-28 to JP11-2

PROCESSOR BOARD TEST
Check from Q4 to the edge for damaged trace
Test P6 & R10
Test Q4 (M26209) - if problem continues, then replace.
Test U22 (M26209) - if problem continues, then replace.
Problem: Hold Lamps 2, 3, & 4 are Nonfunctional

Before removing the processor board, check the following areas:

✔ Use output test to verify the problem
✔ Verify that the lamps are firmly placed in their sockets
✔ Replace the lamp, and test
✔ Check wires and connectors for defects

If that doesn’t work, try the following steps:

○ Replace the processor board with a “known good” one
○ If the processor board seems bad, verify in the tester
○ If the processor board is good, then replace the mother board
○ To repair the mother board, use this diagram to isolate the bad trace
○ If the mother board and processor board are good, then use this diagram to test for wire continuity
Problem: Hold Lamp 5 is Nonfunctional

Before removing the processor board, check the following areas:

- Use output test to verify the problem
- Verify if the lamp is seated firmly in the socket
- Check wires and connectors for defects
- Replace the lamp, and test

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP5-28 to JP5-30

MOTHER BOARD CONTINUITY TEST
JP5-30 to JP1-30A
JP5-28 to JP11-2

PROCESSOR BOARD TEST
Check from Q7 to the edge for damaged trace
Test R16 & R17
Test Q7 (MOC3030), if problem continues, then replace.
Test U23 (MOC3031), if problem continues, then replace.
Problem: Deal/Draw Lamp is Nonfunctional

Before removing the processor board, check the following areas:

- Use output test to verify the problem
- Verify that the lamp is seated firmly in the socket
- Replace the lamp, and test
- Check wires and connectors for defects

If that doesn’t work, try the following steps:

- Replace the processor board with a “known good” one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JP3-34 to JP3-33

MOTHER BOARD CONTINUITY TEST
JP3-33 to JP1-17A
JP3-34 to JP1-12

PROCESSOR BOARD TEST
Check from Q1 to the edge for a damaged trace
Test R3 & R4
Test Q1 (MOC3030) - if problem continues, then replace,
Test U4 (MOC3031) - if problem continues, then replace.
Problem: Bet Max Lamp is Nonfunctional

Before removing the processor board, check the following areas:

✓ Use the output test to verify the problem
✓ Verify that the lamp is seated firmly in the socket
✓ Replace the lamp, and test
✓ Check wires and connectors for defects

If that doesn’t work, try the following steps:

● Replace the processor board with a “known good” one
● If the processor board seems bad, verify in the tester
● If the processor board is good, verify the mother board
● To repair the mother board, use this diagram to isolate the bad trace
● If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST
JPS-28 to JPS-23
MOTHER BOARD CONTINUITY TEST
JPS-28 to JP11-18A
JPS-28 to JP11-2
PROCESSOR BOARD TEST
Check from Q5 to the edge for damaged trace
Test R12 & R13
Test Q5 (MAC3030) - if problem continues, then replace.
Test U14 (MCC3051) - if problem continues, then replace.
Problem: Cashout Lamp is Nonfunctional

Before removing the processor board, check the following areas:

✓ Use output test to verify the problem
✓ Verify that the lamp is seated firmly in the socket
✓ Replace the lamp, and test
✓ Check wires and connectors for defects

If that doesn't work, try the following steps:

☞ Replace the processor board with a “known good” one
☞ If the processor board seems bad, verify in the tester
☞ If the processor board is good, then replace the mother board
☞ To repair the mother board, use this diagram to isolate the bad trace
☞ If the mother board and processor board are good, then use this diagram to test for wire continuity
Problem: Change Lamp is Nonfunctional

Before removing the processor board, check the following areas:

✓ Use output test to verify the problem
✓ Verify that the lamp is seated firmly in the socket
✓ Replace the lamp, and test
✓ Check wires and connectors for defects

If that doesn't work, try the following steps:

✓ Replace the processor board with a “known good” one
✓ If the processor board seems bad, verify in the tester
✓ If the processor board is good, then replace the mother board
✓ To repair the mother board, use this diagram to isolate the bad trace
✓ If the mother board and processor board are good, then use this diagram to test for wire continuity

WIRE CONTINUITY TEST  
JP3-15 to JP3-13

MOTHER BOARD CONTINUITY TEST  
JP3-13 to JP1-15B  
JP3-15 to JP11-2

PROCESSOR BOARD TEST  
Check from Q6 to the edge for damaged trace  
Test R14 & R15  
Test Q6 (MC33030) - if problem continues, then replace.  
Test U15 (MC33031) - if problem continues, then replace.
Problem: Door Open Lamp is Nonfunctional

Before removing the processor board, check the following areas:

- Use output test to verify the problem
- Verify that the lamp is seated firmly in the socket
- Replace the lamp, and test
- Check wires and connectors for defects

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

---

**WIRE CONTINUITY TEST**
JPS3-15 to JPS3-14

**MOTHER BOARD CONTINUITY TEST**
JPS3-14 to JP1-205
JPS5-15 to JP11-2

**PROCESSOR BOARD TEST**
Check from Q8 to the edge for damaged trace
Test R16 & R55
Test Q8 (MAC2030) - if problem continues, then replace.
Test U10 (MAC3301) - if problem continues, then replace.
Before removing the processor board, check the following areas:

- Check the 7VAC, 5A fuse
- Use this diagram to isolate mother board traces (JP1 to JP-21A & 21B)

If that doesn't work, try the following steps:

- Test D1: if "open" replace it (current suppressor 2.8A), and test
Before removing the processor board, check the following areas:

✓ Adjust the video from the dials behind the monitor.

If that doesn't work, try the following steps:

○ Replace the monitor with a known "good one"
○ If the problem is on the processor board, replace the driver in question (red is Q23, green is Q22, blue is Q21, all three are 2N3905s)
Problem: Bill Acceptor is Missing 24 VAC Output Signal

Before removing the processor board, check the following areas:

- Use output test 27 to verify the problem
- Check 24V, 5A fuse
- Check wires and connectors for defects
- See note below

If that doesn't work, try the following steps:

- Replace the processor board with a "known good" one
- If the processor board seems bad, verify in the tester
- If the processor board is good, then replace the mother board
- To repair the mother board, use this diagram to isolate the bad trace
- If the mother board and processor board are good, then use this diagram to test for wire continuity

Note:
Denomination must be set to a value other than 0. In credit mode, the number of credits accumulated must be less than maximum coin-in unless software permits programming level.
Problem: Power Supply – Common Problems

1. "Hot" machine (players get electrical shock) – Check from house outlet to power strip to machine with "outlet polarity checker" for incorrect wiring.

2. Machine "blacked out" (no functions)
   a. If 110VAC 6A fuse keeps blowing, disconnect the hopper SSR and J/P208 (fluorescent connection) to isolate to main transformer and back.
   b. Replace the fuse (always use fast blow fuses with the correct rating).
   c. If the fuse does not blow, reconnect J/P208. This will indicate whether the problem is in the fluorescent circuit or in the SSR.

3. 24VAC fuse or 7VAC fuse constantly blows
   a. Remove the processor board and disconnect all mother board connections, then reseat the processor board.
   b. Replace the fuse (always use fast-blow fuses with the correct rating).
   c. If the fuse does not blow, then remove and replace the processor board to determine if the processor board or mother board is bad.
   d. If the original processor board and mother board did not cause the fuse to blow, then reconnect each connector one by one until the fuse blows.
   e. Trace the harnessing from the last connector to its input or output.
   f. Replace the device, first then check wiring insulation for breaks.

4. Be aware that wires must be fully seated in the terminal block (commoning blocks).

5. Be aware that a bad power strip or a bad power cord will result in power problems.

6. To ensure proper current and voltage for each machine, connect no more than five machines per 20 Amp circuit breaker.

7. A potential hazard exists when a circuit is overloaded. From ground to neutral (at the outlet or across two machines) should not exceed 3VAC.

8. A device connected to the accessory outlet that draws over 2 amps can degrade the filter.
The AC power is routed from the floor through the machine drop area to the lower module. The AC power is then connected by plug to a filter (p/n 272 006 0x). The earth ground is delivered by the AC cord and connects to the lower module for chassis ground. This sets the machine frame or chassis at earth ground.

The 110VAC goes directly to the auxiliary receptacle after which it meets a DPST toggle switch, then it is fused at F3 (110V 6A). It serves three separate functions: 110VAC is delivered to the primary of the main transformer; 110VAC is delivered to all fluorescent lamps; and, 110VAC is delivered to the hopper SSR.

The secondary of the main transformer will provide: 24VAC for the processor board tray transformer, 7VAC for incandescent lamps, and 110VAC for the video monitor.
Before removing the processor board, check the following areas:

- Tray transformer: 24VAC - 16VAC center tapped secondary
- Center tap is the source for logic ground
- Three important logic ground voltages are sequentially developed: Vun (10.5-11.5VDC), and 5.6VDC (RAM)
- VB is developed from the 7VAC secondary tap of the main transformer
- VB becomes a half wave rectified, unregulated DC voltage for I/O drive

Before removing the processor board, check the following areas:

- Check to see if the rectifier diode is passing VAC or not passing VDC
- Check the filter capacitor to see if there is too much VAC (ripple voltage)
- Check the continuity of Vb and +5V
Player's Edge-Plus Microprocessor
This section is an example of the type of information provided in IGT field service manuals. Different machine models (upright, drop-in-bar, slant-top) will have specific differences which include the mother board, wire harnessing and connectors.

S-Plus and Player's Edge-Plus upright machine models are discussed in this section for instructional purposes. Refer to the appropriate IGT field service manual for particular model information.
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<th>P2</th>
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<td>Ppoll (U-4)</td>
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<tr>
<td>SDA (U-15)</td>
<td>GND (U-4)</td>
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<td>SW 19 (J3-23)</td>
<td>Poll (U-4)</td>
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<td>OPTIC RETURN (J7-33 &amp; 34)</td>
<td>GND (U-4)</td>
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<tr>
<td>REEL 1 LED (J7-32)</td>
<td>PayLine 5 (J15 &amp; J3-11)</td>
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<tr>
<td>REEL 2 LED (J7-30)</td>
<td>PayLine 6 (J1-1)</td>
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<tr>
<td>REEL 3 LED (J7-28)</td>
<td>PayLine 2 (J1-3 &amp; J3-6)</td>
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<td>REEL 4 LED (J7-26)</td>
<td>MTR 5 (J8-7)</td>
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<tr>
<td>REEL 5 LED (J7-24)</td>
<td>MTR 3 (J5-5 &amp; J16-14)</td>
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<td>REEL 4 L4-2 (J7-10)</td>
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<td>SPEAKER + (J3-30 &amp; J10-17)</td>
<td>PROGRESSIVE OUT (J12-2)</td>
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<td>I.R. DET M+ SERVCHG 5+ (J1-37)</td>
<td>REEL 4 L-3 (J7-3)</td>
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<td>BILL ACCEPT IN (J6-2)</td>
<td>HANDLE RELEASE (D3 + J10-11)</td>
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<td>COIN IN C (J1-22)</td>
<td>REEL 4 L-3 (J7-37)</td>
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<td>COIN IN A (J-20)</td>
<td>PANEL LED (R4 &amp; J10-1)</td>
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<td>REEL MECH LOOP (J7-7)</td>
<td>REEL 1 L-3 (J9-28 &amp; J7-1)</td>
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<td>SERCHANGE M+ TX PRINT (J3-25 &amp; J13-4)</td>
<td>LOCKOUT (D1 + J1-26 &amp; J9-15)</td>
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<td>CHANGE SW (J1-30)</td>
<td>REEL 2 L-2 (J7-21)</td>
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<td>SPIN SW (J3-15 &amp; J10-13)</td>
<td>REEL 2 L-5 (J7-18)</td>
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<td>PLAY CREDIT SW (J3-17)</td>
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<td>DCLK (J11-1, J3-3 &amp; J14-5)</td>
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<td>STB 1 (J3-4)</td>
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<td>STB 3 (J3-29 &amp; J14-6)</td>
<td>REEL 5 L-5 (J7-12)</td>
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<td>8 VAC HOT (J5-5)</td>
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<td>SPARE LT DRV. (J1-38)</td>
<td>7-8 VAC COM (*1)</td>
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<tr>
<td>INSERT COIN LT (J1-33)</td>
<td>7-8 VAC RET (**2)</td>
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<td>SPIN SW LT (J3-21)</td>
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<td>24 VAC RET (*)</td>
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<tr>
<td>7-8 VAC COM (*1)</td>
<td>24 VAC RET (*)</td>
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Connectors J/P1 and J/P2 for Player's Edge-Plus Machines

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<td>+5V</td>
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<tr>
<td>SDA</td>
<td>2A</td>
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<td>SPEAKER+</td>
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<td>COIN OUT</td>
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<td>JACKPOT PST</td>
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<td>(SW 8) HOLD 2</td>
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<td>(SW 10) HOLD 3</td>
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<td>(SW 11) HOLD 4</td>
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<td>(SW 14) MAX BET</td>
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<td>(SW 19)</td>
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<td>(SW 22)</td>
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<td>(SW 21) CARDGAGE LED</td>
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<td>(LT 1) DEALERDRAW</td>
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<td>STB1</td>
<td>31A</td>
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<td>(LT 9)</td>
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Player’s Edge-Plus Wiring Diagram
(820-151-00, Rev. A, Page 2 of 2)

P/N 606 031 00
HARN. METERS/D.O./RESET/HANDLE

FOR SLOT VERSION

P/N 606 032 00
HARN. METERS/D.O./RESET

COMMONLY USED FOR POKER/KENO

P/N 698 696 01
HARN. TOP CABINET

Appendix - 14
Player's Edge-Plus
Processor Board Schematic
(757-034-11, Rev. C, Pages 2 to 6)