



888-538-1000
 TEL (561) 588-5200
 FAX (561) 493-2999
 PARTS FAX (561) 493-2990
 www.benchmarkgames.com

51 Hypoluxo Rd.
 Hypoluxo, FL 33462-4501

WHIRL-WIN



**PLEASE READ FIRST BEFORE
 PLUGGING IN MACHINE**

77MAN-B

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WHIRL-WIN OPERATOR'S MANUAL

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WHIRL-WIN NEEDS QUALITY MERCHANDISE!

The Whirl-Win game is a new and effective concept in merchandising.

The game was carefully designed with these necessary merchandise requirements:

- ◆ **Prize Value:** Each prize level must contain prizes within a specific price value range.
- ◆ **Prize Fit:** The prizes must fit properly in prize dispenser. Inappropriate prizes could cause hang ups or jams.
- ◆ **Prize display:** The prizes must be carefully displayed to attract maximum interest and use a “prize value tag” to indicate points value for each prize.

Benchmark Games will offer a variety of prize kits to our customers in order to insure that the product is of the correct value, physically fits, and is displayed properly. In order to guarantee trouble free operation and maximum returns, we recommend using only Benchmark product.

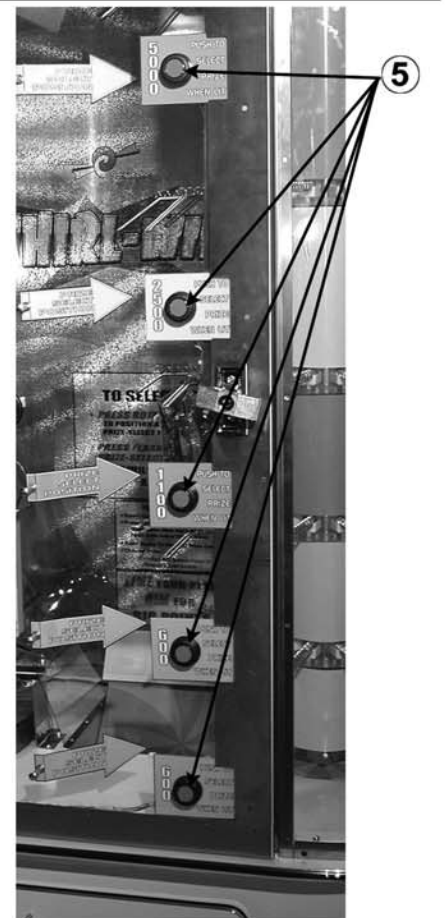
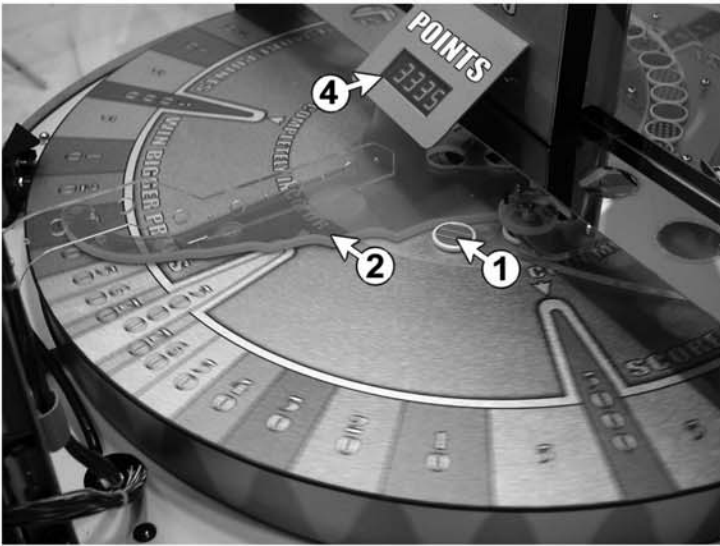
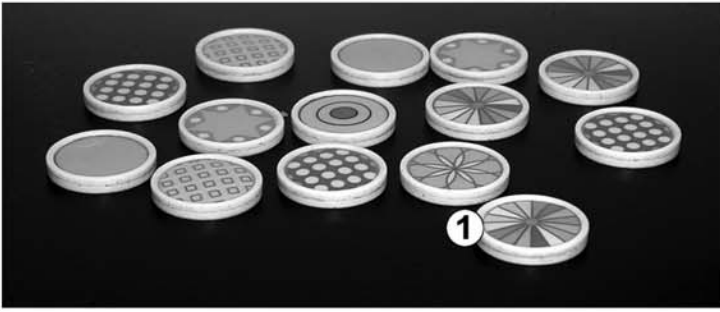
If you must merchandise the machine yourself, please refer to the prize merchandising section and carefully follow suggested procedures.

GENERAL GAME PLAY (refer to pictures, page 3)

1. The player buys plays by inserting coins or dollar bills.
 - ◆ Default cost per play is 12 per dollar or 4 per quarter.
2. The play button is used to release the play disk^① which rides along the disk guide^② until it rests on a point value at the edge of the wheel.
3. As the player scores points, the score value is recorded on the light bar^③ and on the digital points display^④.
4. The prize select buttons^⑤ flash when the players score reaches the corresponding prize level value.
5. The player can decide to select a prize or buy more plays in order to add to the score and win a higher value prize.
6. When a prize is selected, the point value of the prize is subtracted from the total score and the remaining points stay on the game.


SCORING

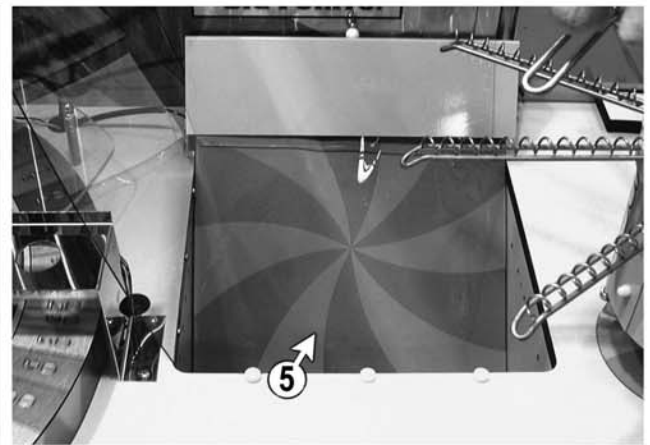
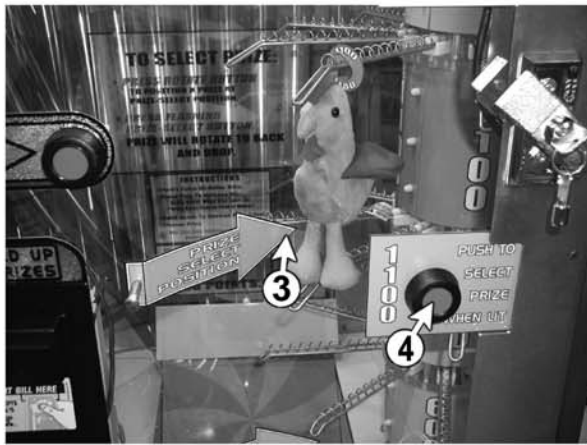
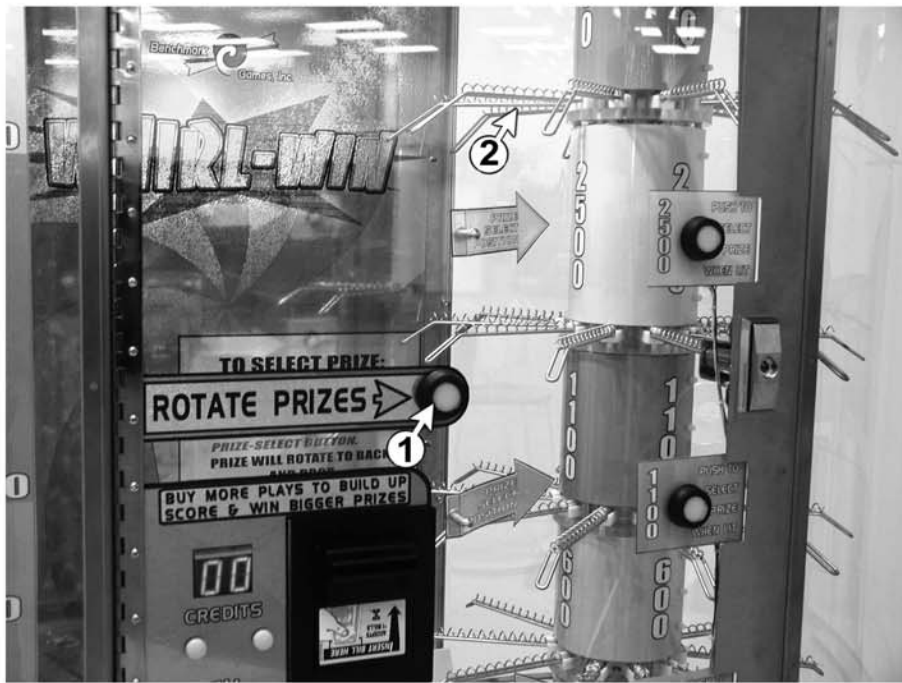
1. The player accumulates points based on the value that the play disk lands within.
2. In order to score on the large point values, the play disk must land completely within the boundaries of the target^⑥.



VENDING A PRIZE FROM THE PRIZE TREE (refer to pictures, page 5)

1. Using the Rotate Prizes Button,^① the player can rotate the prize tree^② in order to select a prize on any of the 10 positions at each prize level. Eligible prizes are indicated by flashing prize select buttons which are activated when the appropriate score is reached.
2. The prize tree will be rotated by the player until the desired prize is located in the prize select position.^③
3. The player will then press the prize select button^④ corresponding to the prize level of the desired prize.
4. The prize tree will rotate around, positioning the selected prize over the prize chute,^⑤ and vend the prize.
5. The player will then open the lower prize door^⑥ to retrieve the prize.
6. If there are enough points remaining, the player may select another prize

Notes: If a prize select button is pressed and the prize arm in the prize select position does not contain a prize, the vend mechanism will time out and allow the player another chance to vend a prize. If the player selects another empty row, the prize mechanism will time out and the player will lose his points. The points display will show  (meaning drop error) until more plays are purchased. This also applies if for some reason a prize successfully vends, but is not sensed by the machine, protecting the operator against a player emptying the machine in the event of a failing sensor.



RETRIEVING A PRIZE FROM THE UPPER PRIZE DOORS (refer to pictures, page 7)

1. When a player accumulates enough points to light the prize select buttons① for the Upper Prize Doors,② the appropriate prize select buttons will light.
2. The player can unlock the Upper Prize Door by pressing the prize select button next to the desired prize.
3. The upper prize door will remain unlocked for 30 seconds from the time the prize select button is pressed allowing the player to open the door and retrieve the prize.
4. If there are enough points remaining, the player may select another prize.

LOADING THE MERCHANDISE

Prizes hang from the prize tag on the prize tree at the appropriate prize levels. Prizes are also loaded into four prize doors at the top of the game.

Loading the prize tree:

There are 5 levels of prizes on the prize tree:

The bottom two levels are blue (600 points).

The third level is green (1100 points).

The fourth level is yellow (2500 points).

The fifth level is orange (5000 points).

Prizes are identified with a prize value tag③ matching one of the above mentioned levels.

The prizes must be loaded so that the prize value tag matches the prize level on the tree.

In order to offer the best selection of prizes to the player, common prizes on the prize tree should be loaded on the same prize arm whenever possible.

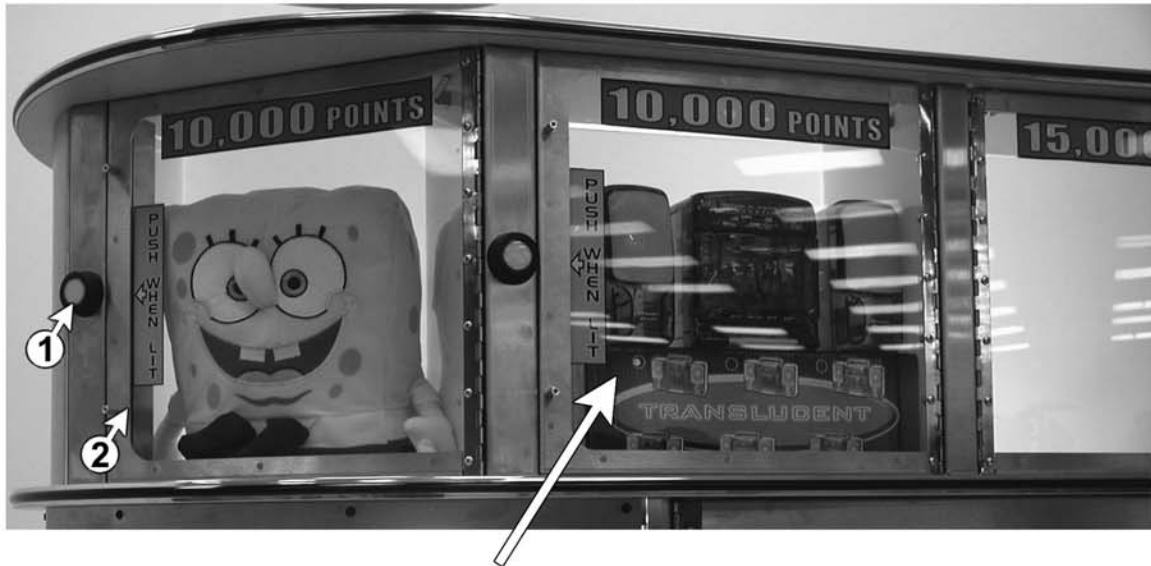
When loading tree, note that:

1. Prizes must have a minimum of ½" clearance between the bottom of the hanging prize and the top of the prize dispensing spring located below it (see picture, page 7).

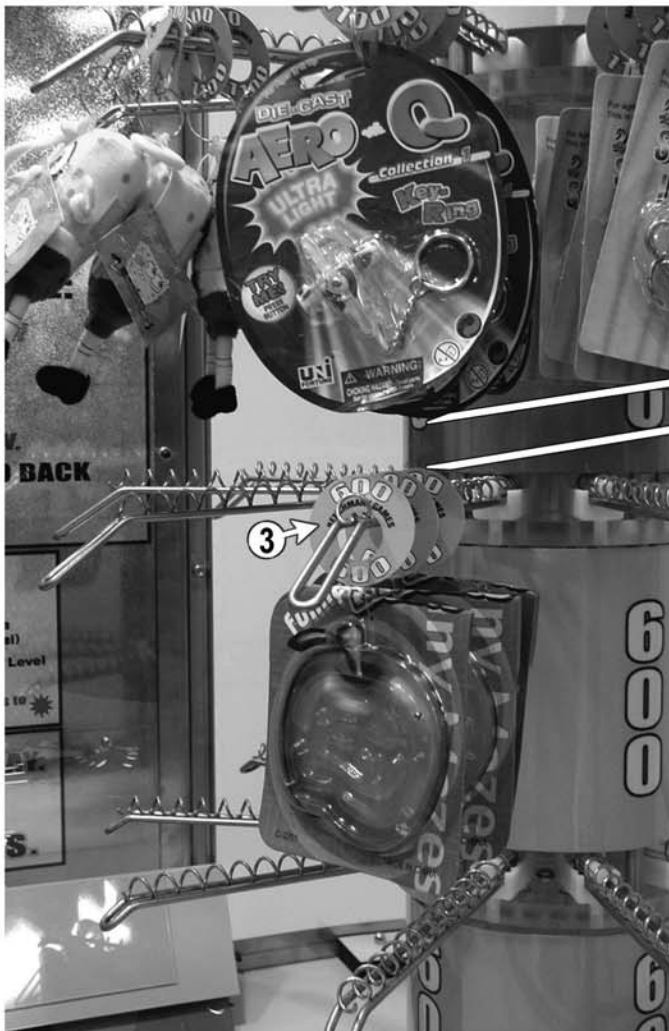
2. Prizes must hang no closer than every other ring on the prize dispense spring(see picture, page 7). If they hang one immediately behind the other with no space between them, the machine will likely vend two prizes before it can sense the first prize.

3. The prizes should not be allowed to tangle with the prizes hanging on the next prize arm beside it.

4. For the 5000 level, it is a good idea to alternate large items such as plush with narrow items such as watches on every other prize arm. It is also a good idea on every prize level to have some prizes that take up most of the height of the prize area. This makes the game look more appealing and attracts more players.



Note: For more appealing upper-level prize display, remove prize from package.
 This prize is displayed sitting on top of its package.



$\frac{1}{2}$ "

Leave 1/2" clearance between prize rows.

Hang prizes no closer than every other ring on the prize-dispense spiral spring.



LOADING THE UPPER PRIZE DOORS (refer to picture, page 9)

- ◆ The upper prize doors can be opened by pushing or pulling the unlock tab^① located inside the game.

- ◆ The prizes loaded into the upper prize doors are not tagged, but should maintain a value appropriate for the point value assigned to the corresponding door.

- ◆ The prizes should not be oversized so that there is excessive continuous pressure on the front door disallowing the unlocking mechanism to function properly. Use Benchmark product to insure proper fit.

- ◆ The prizes should be displayed so that they can be easily seen by the player.
 - ▶ Boxed electronics, for example, should be unpacked and displayed on top of the box in which it came if size permits (see page 7).

MERCHANDISING

The Whirl-Win is designed with a dollar value assigned per point scored. Each prize level must therefore contain prizes with dollar values appropriate for that level. This can be broken down as follows:

- 600 point level = 43 ¢ per prize average.
- 1100 point level= 75 ¢ per prize average.
- 2500 point level= \$2.00 per prize average.
- 5000 point level= \$4.00 per prize average.
- 10000 point level= \$12.00 per prize average.
- 15000 point level= \$18.00 per prize average.

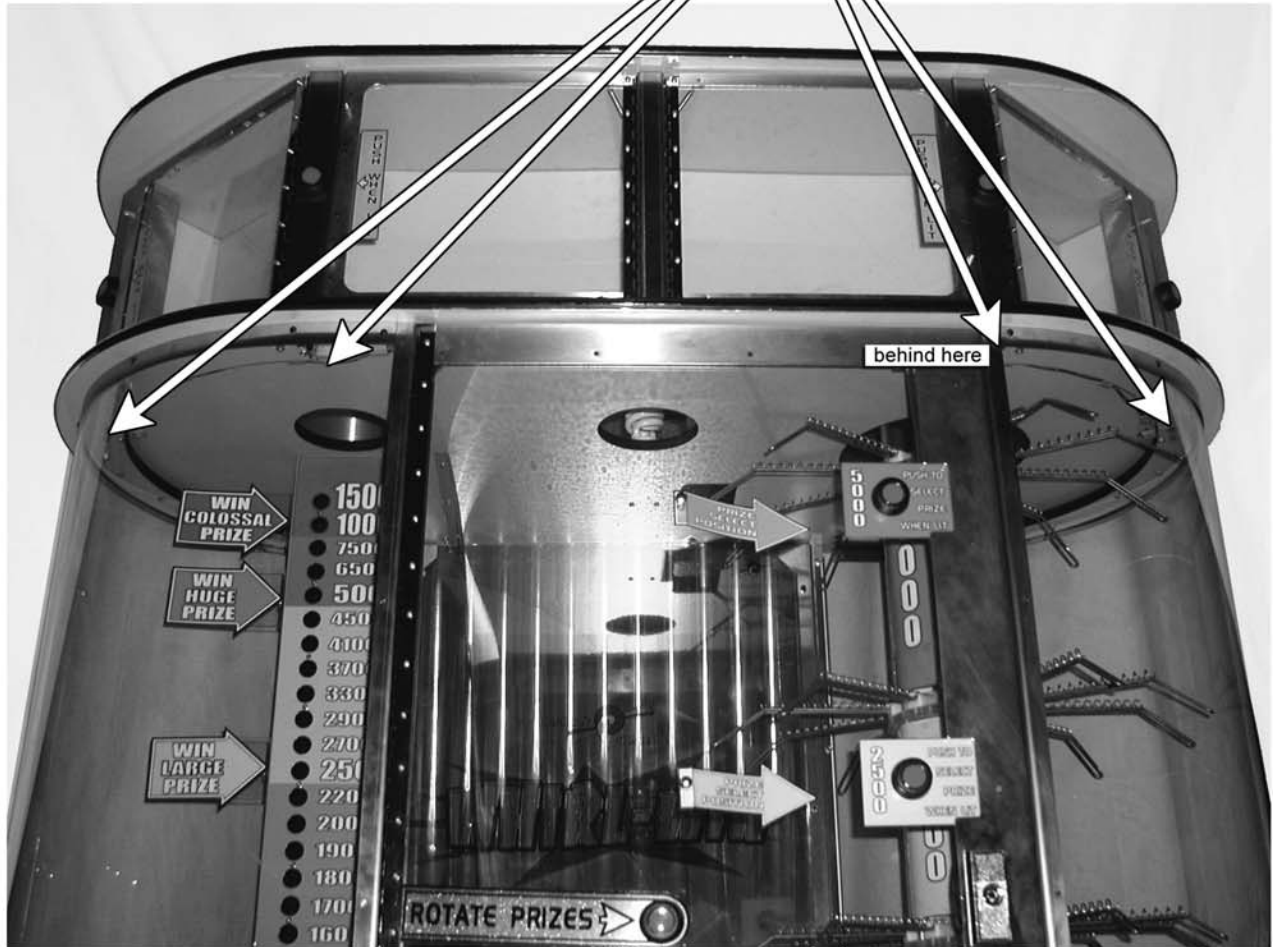
TAGGING YOUR OWN MERCHANDISE

- ◆ The prize tags are securely attached to the prizes using a tag gun.

- ◆ The prize tags are oriented so that the front of the prize hangs in view of the player toward the outside of the game.

- ◆ At least ½" clearance between the bottom of the hanging prize and the top of the vending spring below it must be maintained. Keep this in mind when tagging the merchandise (see the picture on page 7).

① -- Upper Prize Door UNLOCK TAB locations



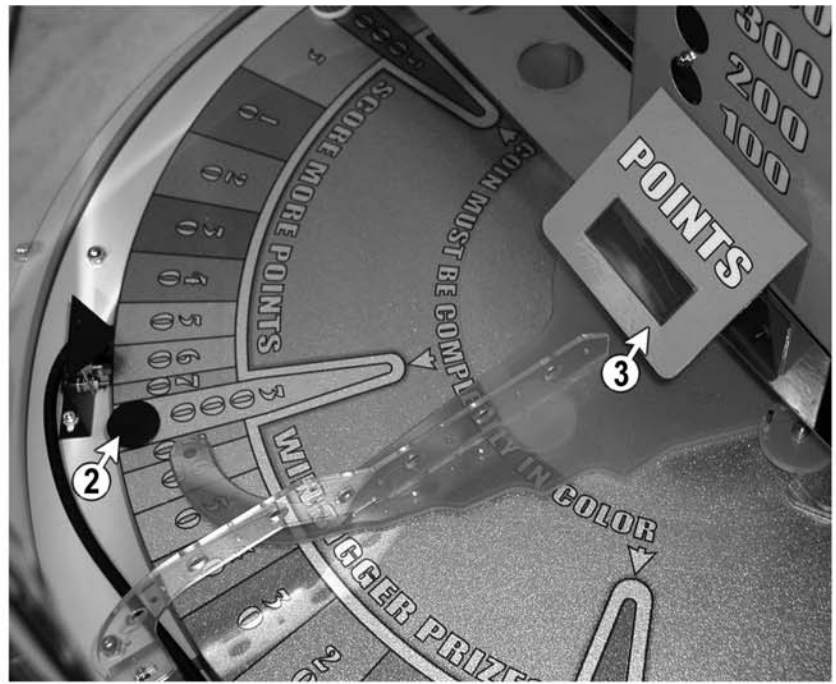
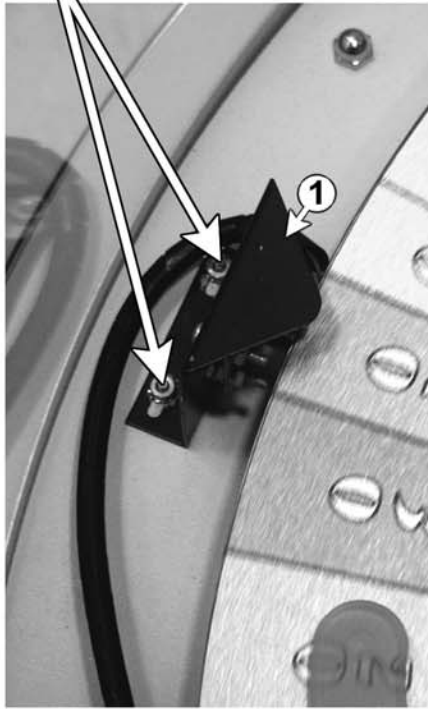
The Unlock Tabs are reached from inside the glass. Push or pull the tab and open the door.

ADJUSTING THE PLAY DISK READING OPTO SENSOR (refer to pictures, page 11)

1. Power the machine off.
2. Loosen the studs holding the disk-sensing opto sensor ① in place.
3. Position the test disk ② on the wheel as shown. The nipple on one side of the disk should press into the hole in the wheel in the center of one of the 3000 point targets. If no test disk is available, tape a coin in the center of the 3000 point target with the hole in it.
4. Place a thin opaque material in the opening of the disk-sensing opto sensor and hold it there while the game is powered on. Hold the material there until the game goes through its entire start up routine.
 - ▶ The digital points display ③ will now show a number describing the step count of the test disk.
5. Loosen screw studs.
6. By sliding the disk-sensing opto sensor back and forth on the screw studs, you can adjust the step count number. Adjust the disk-sensing opto sensor until the step count number reads the number 16.
7. Tighten the disk-sensing opto sensor in place.

screw studs

Adjusting the disk-sensing opto sensor



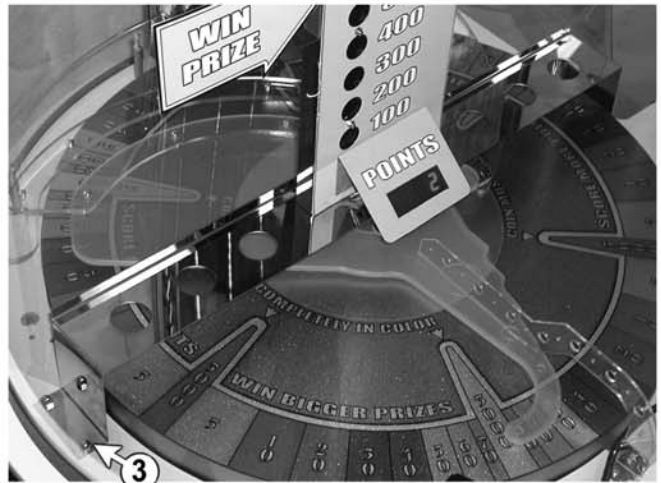
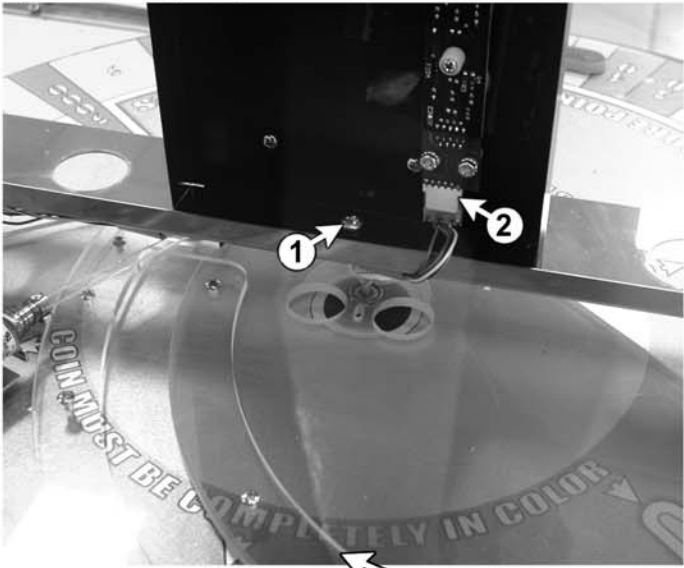
Hold opaque material here to break opto on power-up.

REMOVING THE ROTATING WHEEL (refer to pictures, page 13)

1. Remove light bar mount screw.^①
2. Remove light bar connector.^②
3. Remove screws that secure light bar mount bracket.^③
4. Pivot light bar forward and lift light bar mount bracket off of playfield.
5. Remove (3) nuts^④ that secure the disk guide assembly.^⑤
6. Remove the adjusting screw^⑥ that secures the front of the disk guide (when replacing, be sure to adjust tip of pointer about 1/16" above the wheel before tightening).
7. Carefully disconnect the wires attached to the disk release solenoid.^⑦
8. Lift the disk guide assembly off of the center pin.
9. Remove large timing belt gear^⑧ from wheel shaft by loosening clamping collar.^⑨
You need to open the left side door on the lower cabinet in order to access this collar.
10. Remove the shaft collar^⑩ that secures the wheel to the playfield.
11. Lift the wheel out of the game.

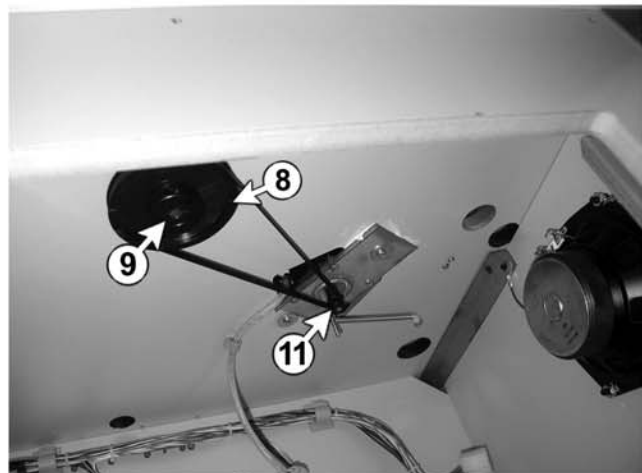
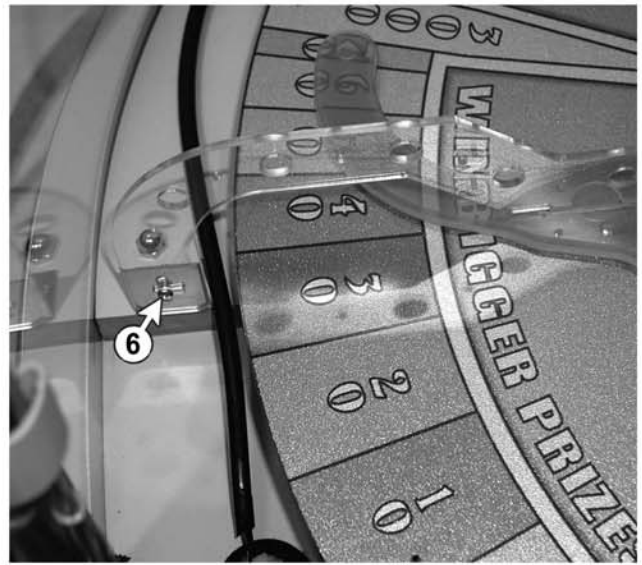
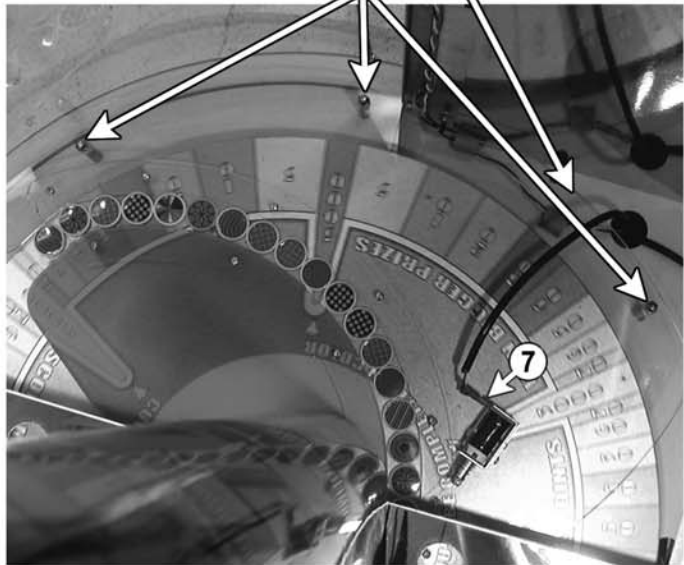
NOTE: When replacing wheel, be sure to tighten clamping collar around large timing belt gear securely. Be sure to position gear on shaft so that it is horizontally in line with the small timing belt gear.^⑪

(back view of lightbar)



(2 screws at each end of light bar mount bracket)

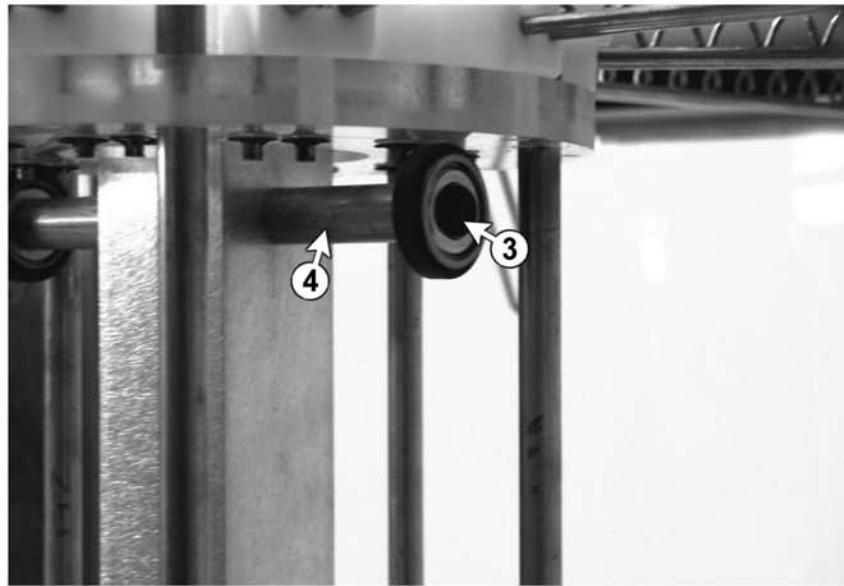
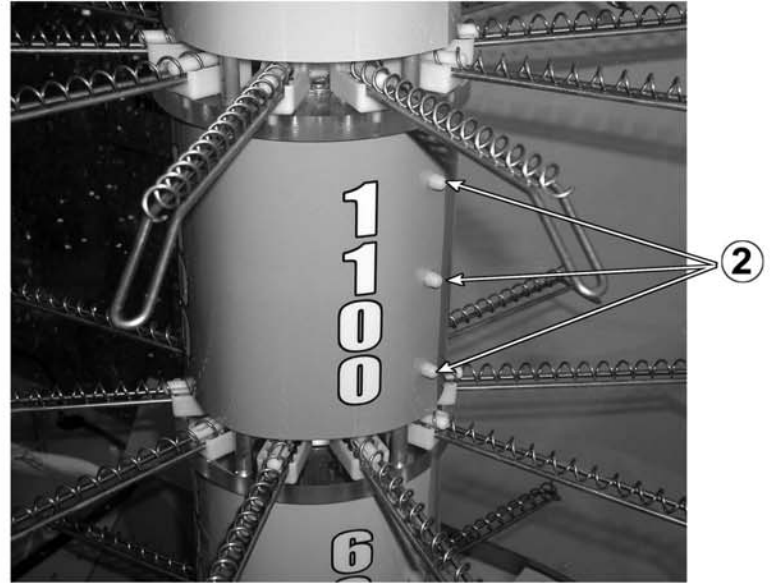
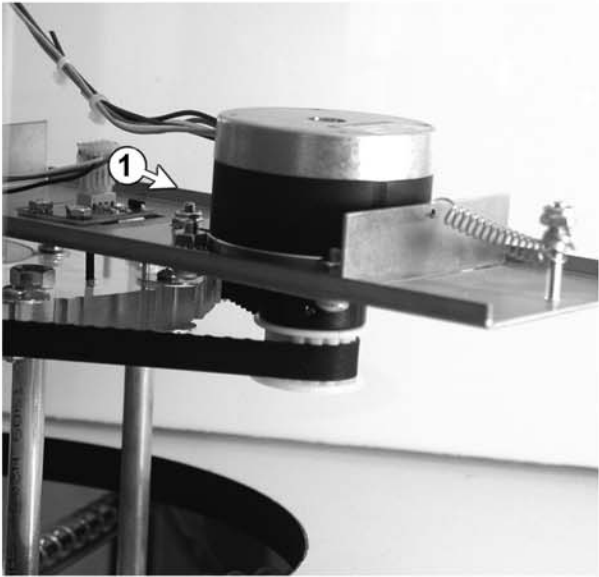
5 (clear acrylic disk guide assembly)



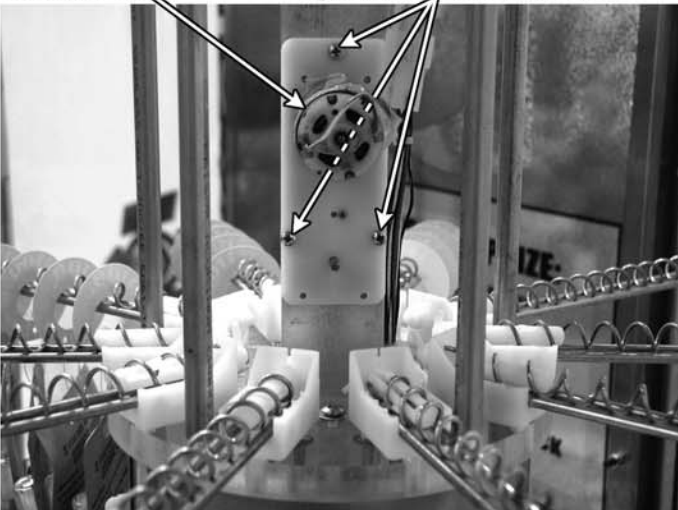
NOTE: These are views of underside of playfield looking up inside lower left access door.

REPLACING A VEND MOTOR (refer to pictures, page 15)

1. Remove upper back of game by removing 6 securing screws.
2. Loosen motor securing nut.^①
3. Remove timing belt from timing belt pulleys.
4. Remove the Green 1100 point banner that is wrapped around the top row of the prize tree by removing plastic nuts.^②
5. Remove the screws securing the support bearings.^③
6. Remove support bearings, support rod, and support rod spacers.^④
Allow the prize tree to rest on the playfield.
7. Disconnect the harness from the motor needing replacement.
8. Remove the (3) screws attaching the motor^⑤ that needs replacement.
9. Pull motor out of center post.^⑥
10. Reverse the previous steps to install the motor.
 - ▶ Note: When replacing point banner, be sure that it is positioned above (not in contact with) vend springs



⑤ vend motor ⑥ vend motor attaching screws

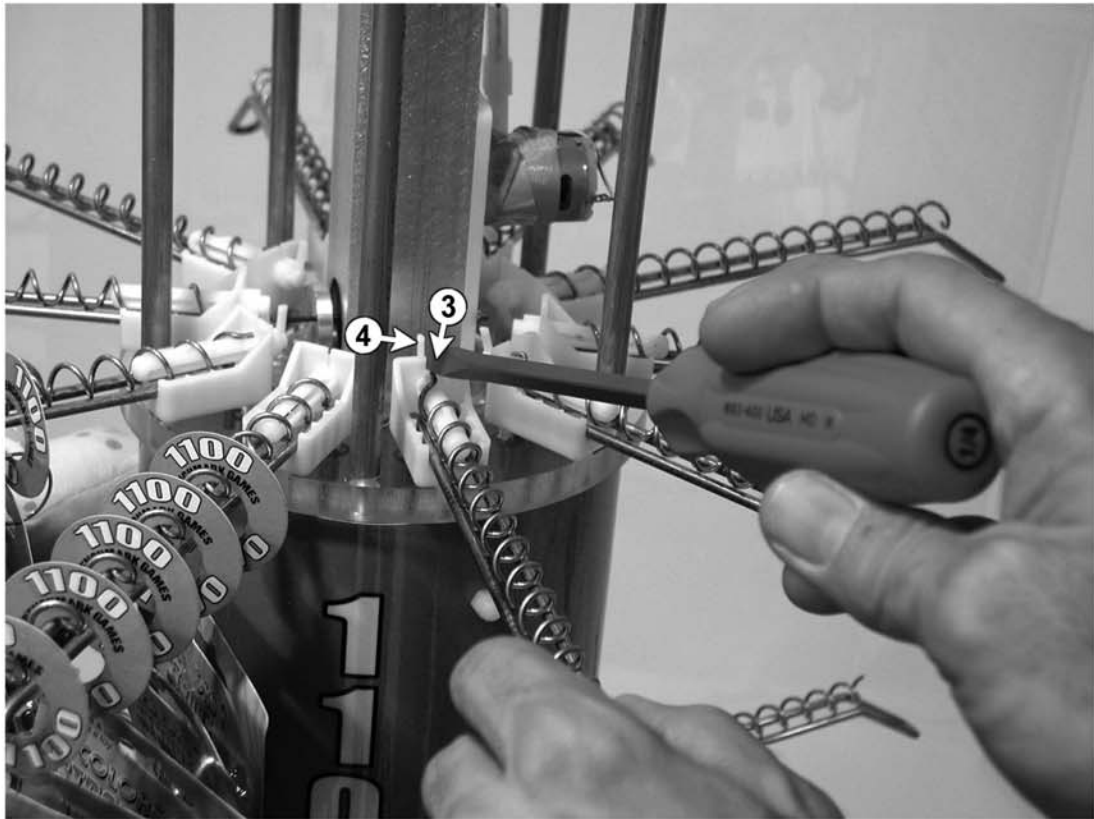
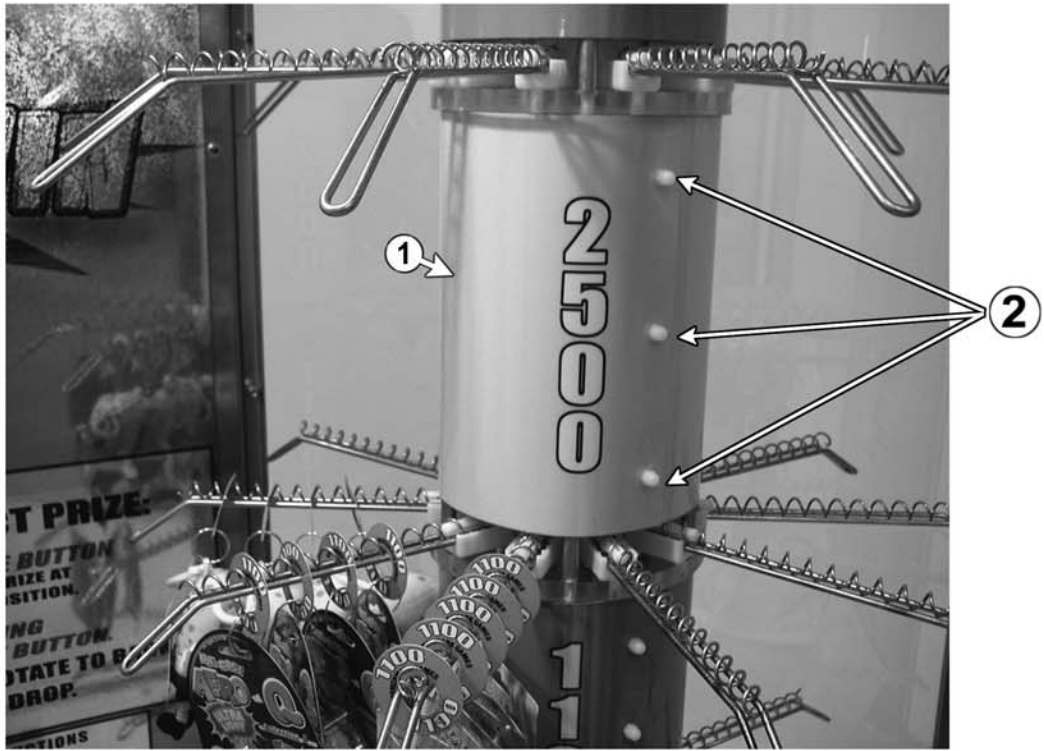


motor removed from center post



REPLACING VEND SPRINGS (refer to pictures, page 17)

1. Remove the point banner① above row of vend spring you want to replace from prize tree by removing plastic nuts.②
2. Insert flat head screwdriver into slot in vend spring bracket③ and carefully spread plastic.
3. Align plastic tab④ on vend spring with slot in vend spring bracket, pull to remove vend spring.
4. Push to snap replacement vend spring into vend spring bracket with plastic tab aligned with slot.
5. Replace point banner. Be sure to replace banner so that it is positioned above (not in contact with) vend springs.

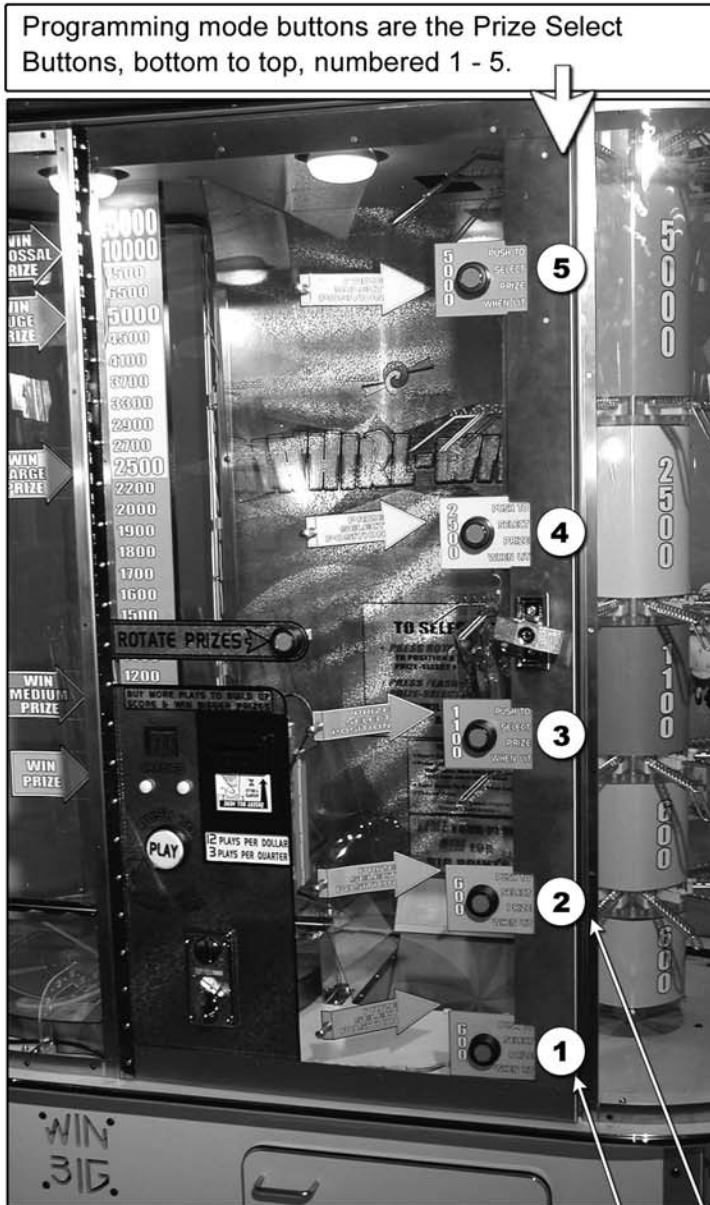


PROGRAMMING INSTRUCTIONS

PROGRAMMING MODE:

There are several programming options available for the Whirl-Win. Please see the "Programming Modes and Options" section for programming options.

To program Whirl-Win you must put the game into programming mode. This is accomplished by using the Prize Select buttons on the front of the game. You change the values for the different modes and then save the new settings.



To enter Programming Mode:

1. Power the game off for a minimum of 15 seconds.
2. Power the game back on.
3. Press and hold Prize Select buttons #1 & #2 until "DIAG"(short for DIAGNOSTICS) is shown on the points display.
 - a. You must get to the Prize Select buttons shortly after powering on the game in order to activate programming mode, but one person should have enough time to get there after powering the game on.

Programming mode buttons are the Prize Tree Buttons, bottom to top, numbered 1 - 5.



PROGRAMMING MODE, continued...

2. Using button #3(to decrement the mode), and button #5 (to increment the mode), move to the mode you want to change. The mode will be displayed on the 2-digit display⁽¹⁾ on the door.

3. When you reach the mode you want to change, press button #4 to lock in that mode. Then, using buttons #3 and #5, change the value on the 5-digit display⁽²⁾ on the playfield.

4. After changing the value to the desired value, you must press button #4 again to lock in the value. The 5-digit display will read "OH"(short for OK) for a second, telling you that it understands the new value.

5. After setting all of the values that you want to change, you must change the mode(using buttons #3 or #5) until the 5-digit display reads "EHIT"(short for EXIT), then press the #4 button again to exit programming mode. NOTE: The game will then re-initialize and be ready for gameplay.

(1) 2-digit display



(2) 5-digit display



PROGRAMMING MODES & VALUES

For programming purposes, the prize trees are numbered 1-5 starting at the bottom of the game. The prize doors on the top of the game are numbered 1-4 from left to right.

config 0. default. This sets the game back to default settings. To do this, you must set the value to 2, then exit out of programming.

config 1. 24 (locked out)

config 2. 24 (locked out)

config 3. 44 (locked out)

config 4. 50 (locked out)

config 5. 100 (locked out)

config 6. 100 (locked out)

config 7. 100 (locked out)

config 8. 150 (locked out)

config 9. 150 (locked out)

config 10. mercy points. 1-50. Multiples of 1. Default is 1. Only adds points if no points are won.

Accounting:

config. 11. tree level 1 wins#.

config. 12. tree level 2 wins#.

config. 13. tree level 3 wins#.

config. 14. tree level 4 wins#.

config. 15. tree level 5 wins#.

config. 16. door 1 wins#.

config. 17. door 2 wins#.

config. 18. door 3 wins#.

config. 19. door 4 wins#.

config. 20. total wins#

config. 21. tree level 1 percent.

config. 22. tree level 2 percent.

config. 23. tree level 3 percent.

config. 24. tree level 4 percent.

config. 25. tree level 5 percent.

config. 26. door 1 percent.

config. 27. door 2 percent.

config. 28. door 3 percent.

config. 29. door 4 percent. Functions 21-30 should add up to 100 percent.

config. 30. net percent (what percent the game is keeping. eg: \$100.00 in - 40% payout = 60% net percent.)

config. 31. tree level 1 value in pennies.

config. 32. tree level 2 value in pennies.

config. 33. tree level 3 value in pennies.

config. 34. tree level 4 value in pennies.

config. 35. tree level 5 value in pennies.

config. 36. door 1 value in pennies.

config. 37. door 2 value in pennies.

config. 38. door 3 value in pennies.

config. 39. door 4 value in pennies. Functions 31-39,(prices of prizes have to be programmed).

config. 40. gross income (how many quarters went into game)

config. 41. net income (how many quarter went into game - how much money went out in prizes)

config. 42. clear accounting.

config. 43. point value start. 0-500. Increments of 1. Default is 0. The point value that the game starts at when it is first initialized.

config. 44. disable drop error. 0=on. 1=off. will give a prize drop error if game does not vend after 3 attempts.

config. 45. attract mode seconds. Range is 10-1200. Increments of 10. Default is 20. How often the attract mode starts.

config. 46. 120.

config. 47. 5.

config. 48. exit.

DIP SWITCH SETTINGS FOR MAIN BOARD

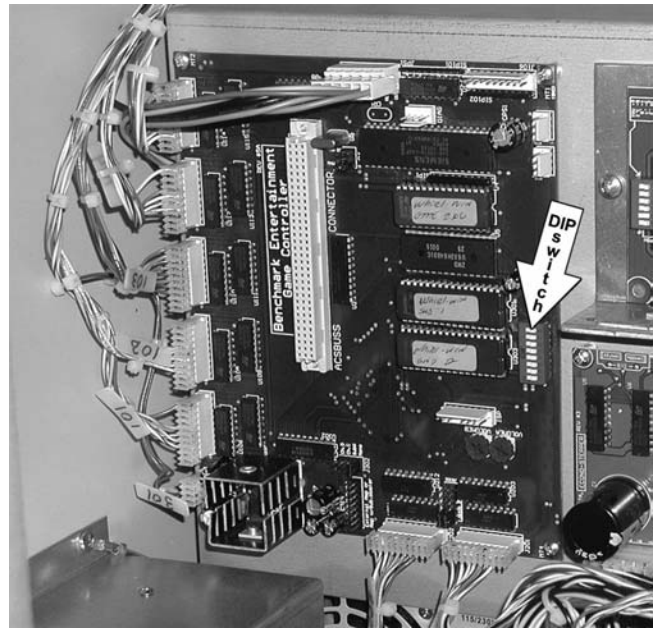
Play Disks Per Coin

	DIP 1	DIP2	DIP3	DIP4
1 Disk/Coin, 4 Disks/Dollar	OFF	OFF	OFF	OFF
1 Disk/Coin, 5 Disks/Dollar	OFF	OFF	ON	OFF
1 Disk/Coin, 6 Disks/Dollar	OFF	OFF	OFF	ON
1 Disk/Coin, 7 Disks/Dollar	OFF	OFF	ON	ON
2 Disk/Coin, 8 Disks/Dollar	ON	OFF	OFF	OFF
2 Disk/Coin, 9 Disks/Dollar	ON	OFF	ON	OFF
2 Disk/Coin, 10 Disks/Dollar	ON	OFF	OFF	ON
2 Disk/Coin, 11 Disks/Dollar	ON	OFF	ON	ON
3 Disk/Coin, 12 Disks/Dollar	OFF	ON	OFF	OFF
3 Disk/Coin, 13 Disks/Dollar	OFF	ON	ON	OFF
3 Disk/Coin, 14 Disks/Dollar	OFF	ON	OFF	ON
3 Disk/Coin, 15 Disks/Dollar	OFF	ON	ON	ON
4 Disk/Coin, 16 Disks/Dollar	ON	ON	OFF	OFF
4 Disk/Coin, 17 Disks/Dollar	ON	ON	ON	OFF
4 Disk/Coin, 18 Disks/Dollar	ON	ON	OFF	ON
4 Disk/Coin, 19 Disks/Dollar	ON	ON	ON	ON

DIP Switch #5 & #6.....Not Used
 DIP Switch #7.....Not Used

Attract Mode

DIP Switch #8	DISABLE ON	ENABLE OFF
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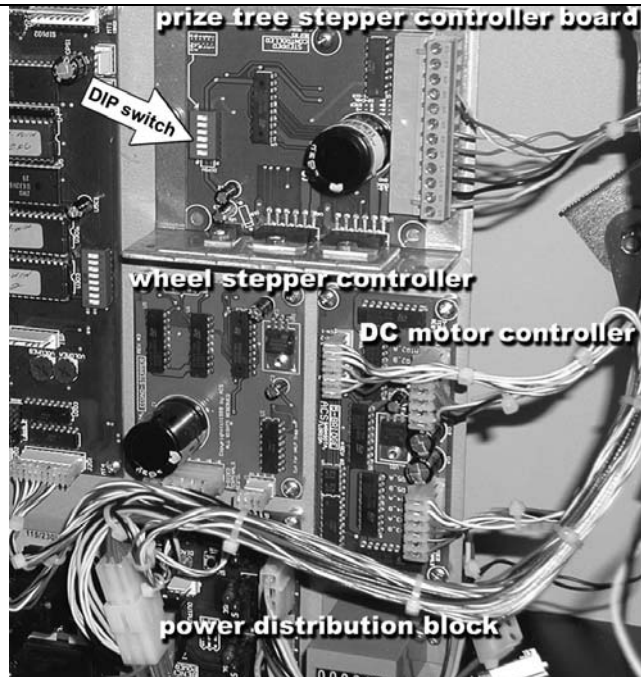


Factory recommended DIP switch settings:

DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	DIP 6	DIP 7	DIP 8
ON	OFF	OFF	ON	OFF	OFF	OFF	OFF

DIP SWITCH SETTINGS FOR STEPPER CONTROLLER BOARD

DIP1	ON
DIP 2	ON
DIP 3	ON
DIP 4	ON
DIP 5	OFF
DIP 6	ON



ERROR MESSAGES

(refer to picture, page 23)

The Points Display will show an Error Display when certain problems occur.

 = OPTO ERROR

This error is shown when:

1. The rotating wheel is stopped or moving too slowly.

◆ If this is the case, check the motor and belt drive to the wheel.

2. There is a problem with the opto sensor which reads a pin on the bottom side of the rotating wheel.

◆ To troubleshoot: Open the lower left access door so that you can view the opto PCB through a hole in the bottom of the playfield(see picture, page 23).

The red L.E.D. should flash once per wheel revolution when the pin in the wheel breaks the opto.

 = PRIZE DROP ERROR

This error is shown when 3 attempts were made to vend a prize from the prize tree, but no prizes were sensed. This can be caused by:

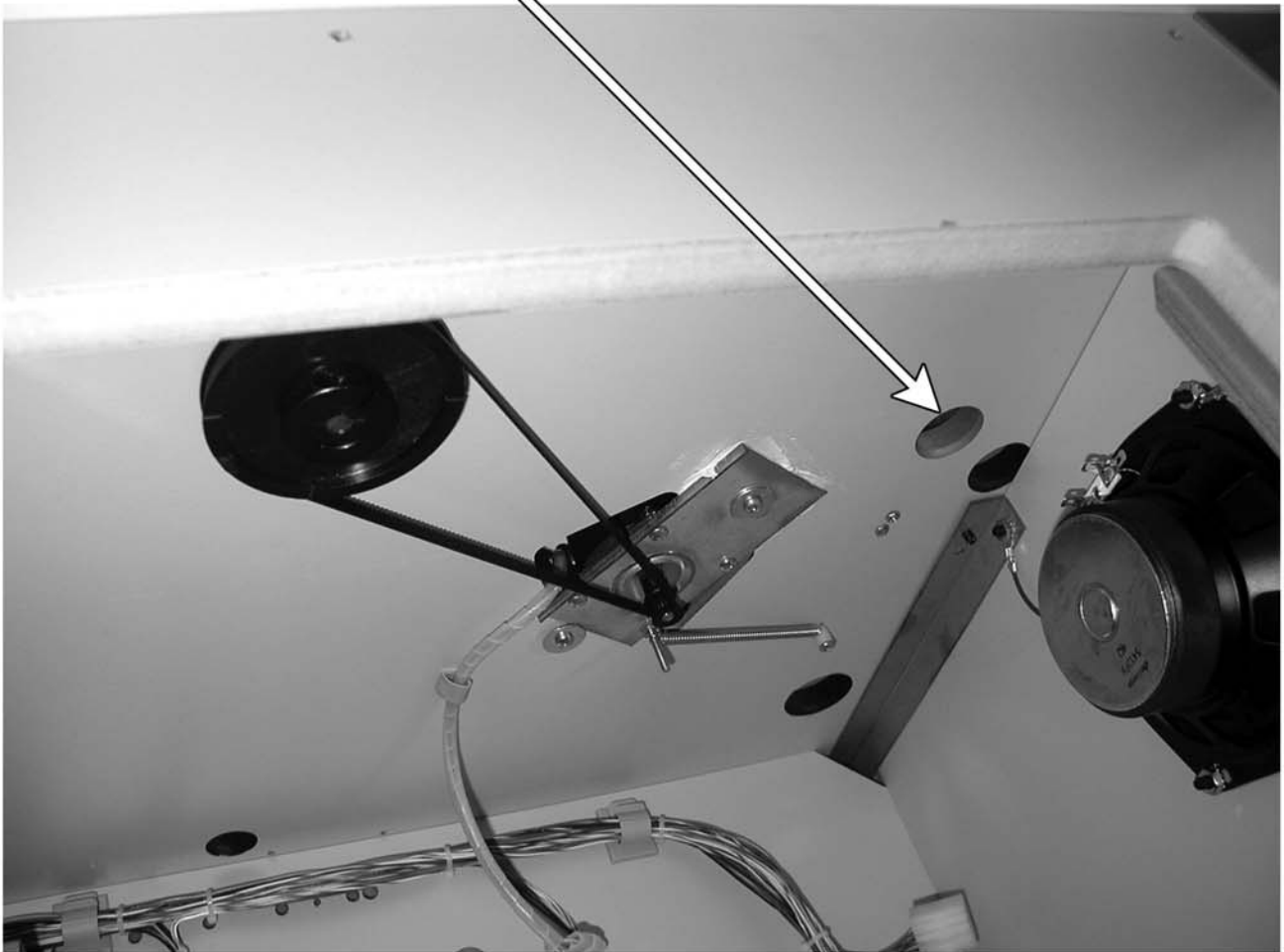
1. Three attempts to vend from an empty row.

2. Prize sensor opto out of adjustment.

3. Defective prize sensor opto.

Picture inside the lower-left access door:

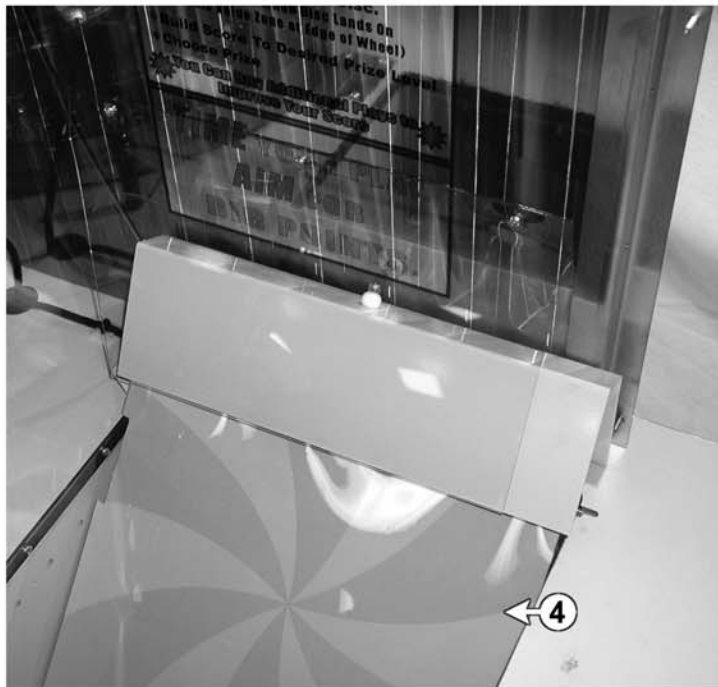
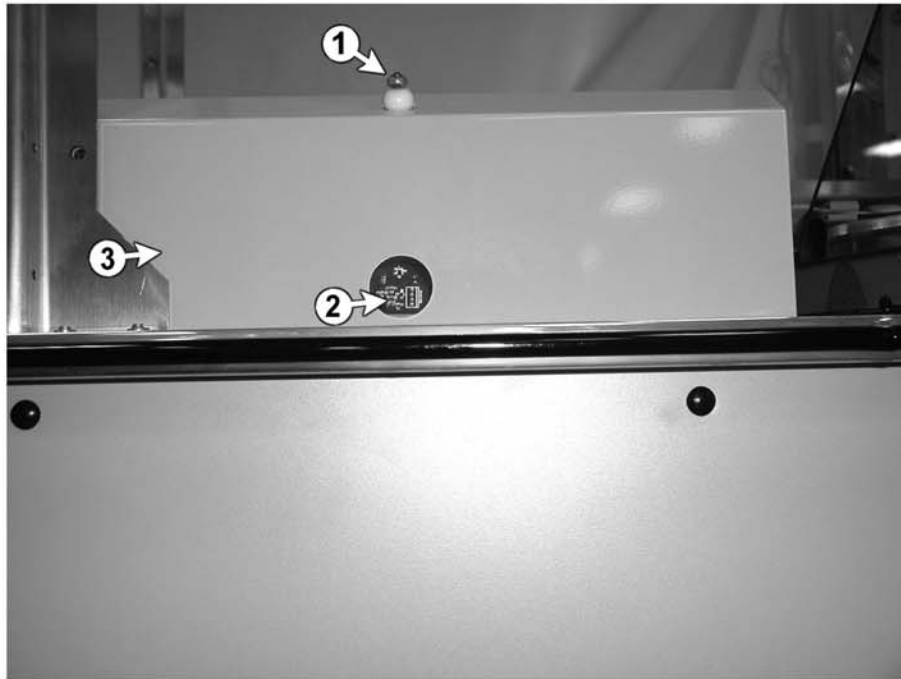
View the opto PCB through this hole in the bottom of the playfield.



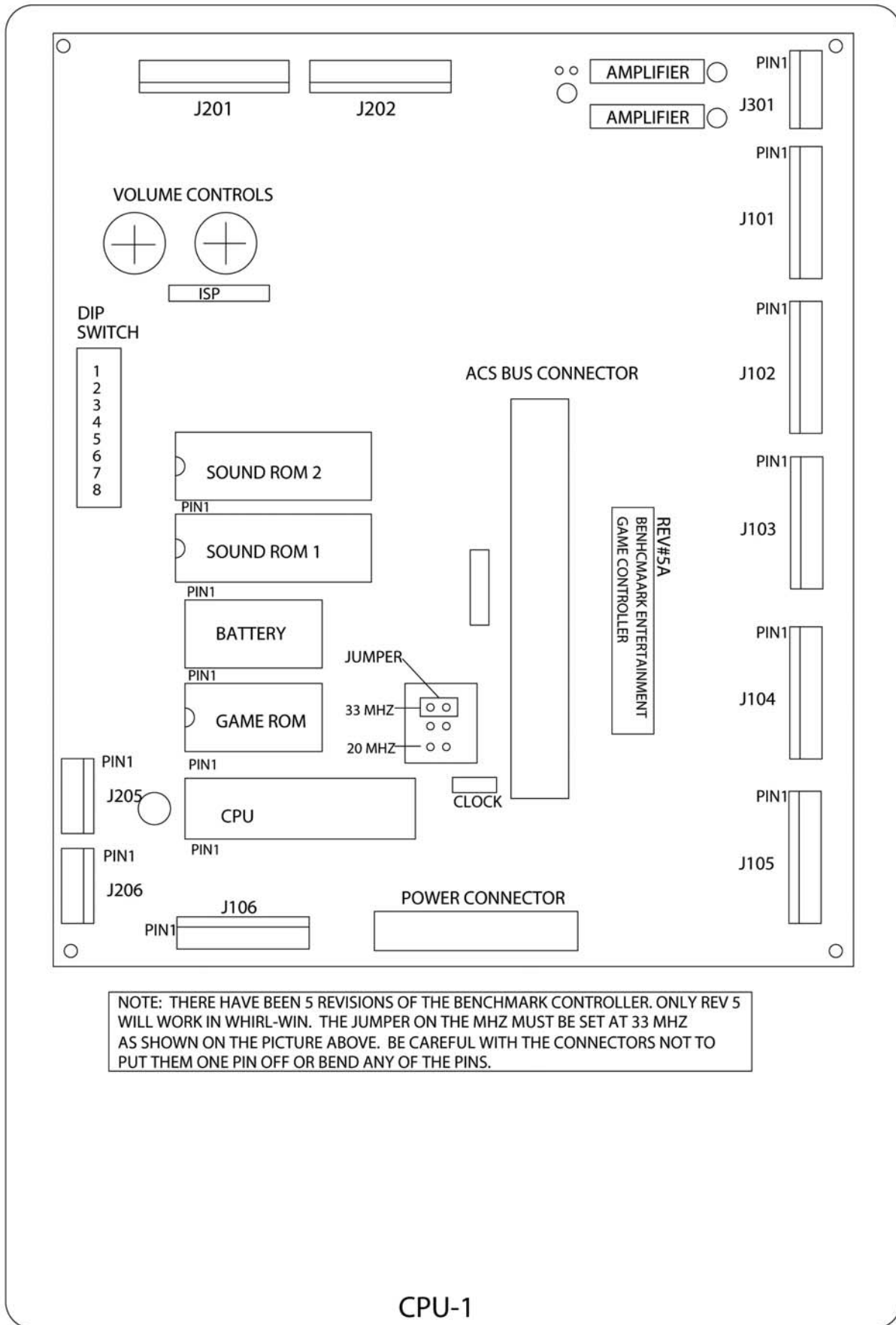
PRIZE SENSOR OPTO ADJUSTMENT (refer to pictures, page 25)

1. Remove wood back of game.
2. Turn Adjustment Screw① clockwise until red L.E.D. on opto PCB② lights up. (L.E.D. on opto can be viewed through the hole in the Sensor Bracket.③)
3. Slowly turn adjustment screw counter-clockwise until L.E.D. just goes out.
4. Verify adjustment by tapping Prize Chute④ and watching L.E.D..
 - ◆ If L.E.D. has a tendency to stay on, back off on adjustment screw a little more. It is important that the L.E.D. not be stuck on.

View from back of game(with wood back removed)
of Sensor Bracket with Adjustment Screw & opto L.E.D.



CPU BOARD BLOCK DIAGRAM

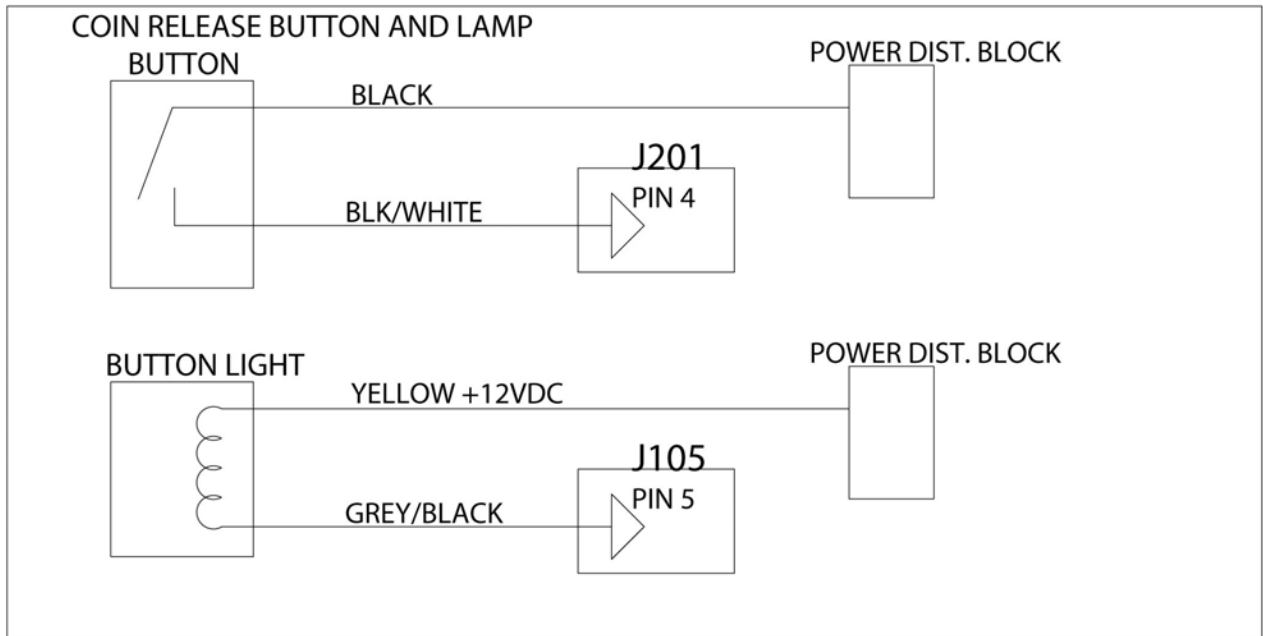
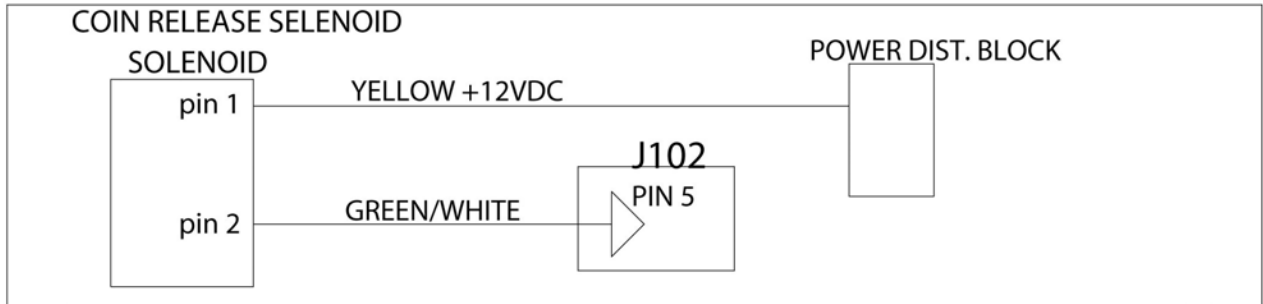
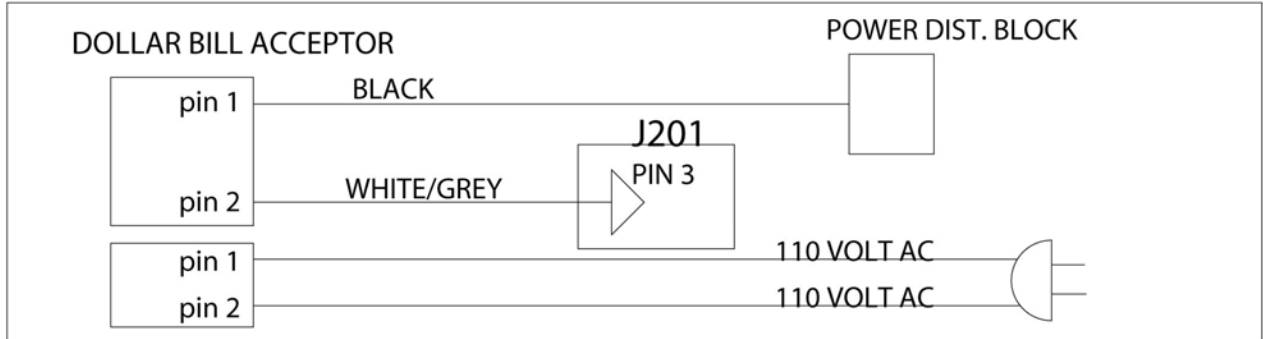
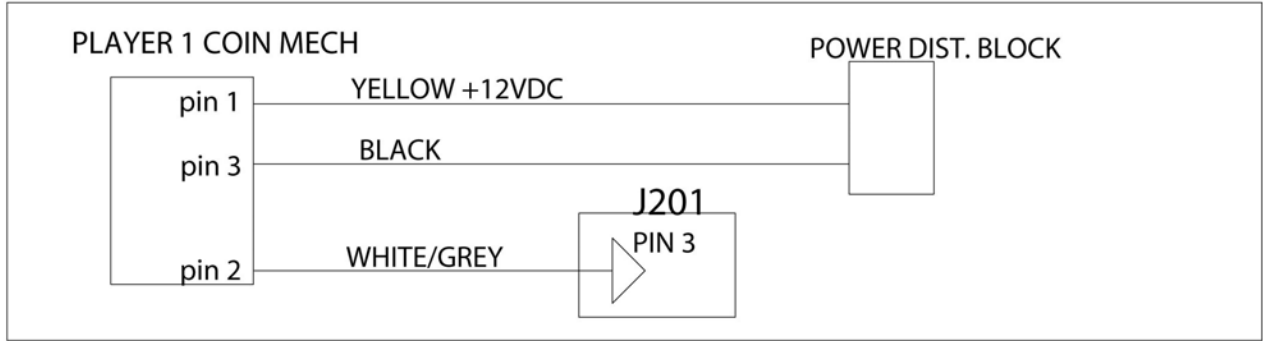


NOTE: THERE HAVE BEEN 5 REVISIONS OF THE BENCHMARK CONTROLLER. ONLY REV 5 WILL WORK IN WHIRL-WIN. THE JUMPER ON THE MHZ MUST BE SET AT 33 MHZ AS SHOWN ON THE PICTURE ABOVE. BE CAREFUL WITH THE CONNECTORS NOT TO PUT THEM ONE PIN OFF OR BEND ANY OF THE PINS.

CPU-1

Schematic:

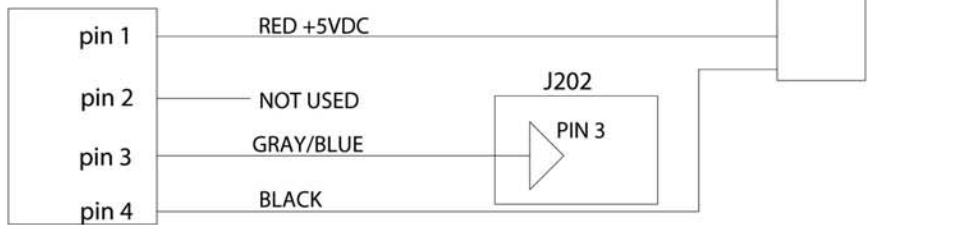
note: not all connectors are shown in the schematics.



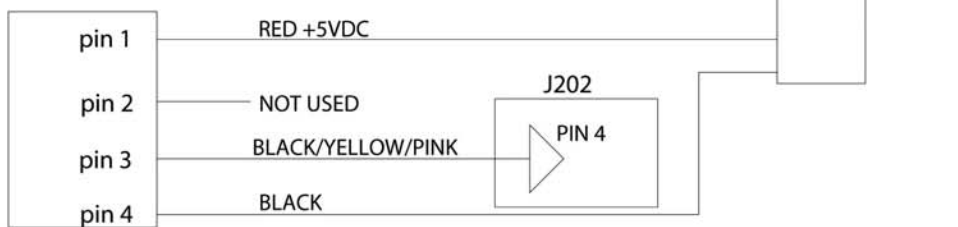
Schem-1

Schematic:

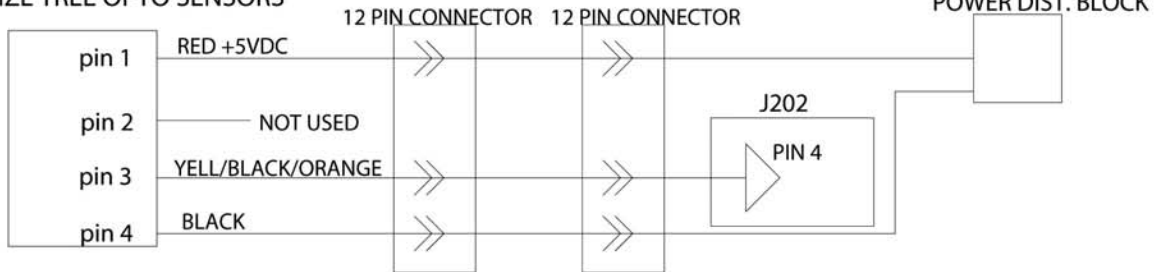
HOME OPTO SENSORS



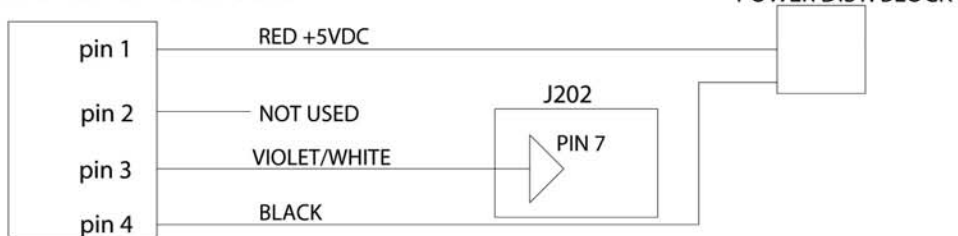
COIN OPTO SENSORS



PRIZE TREE OPTO SENSORS

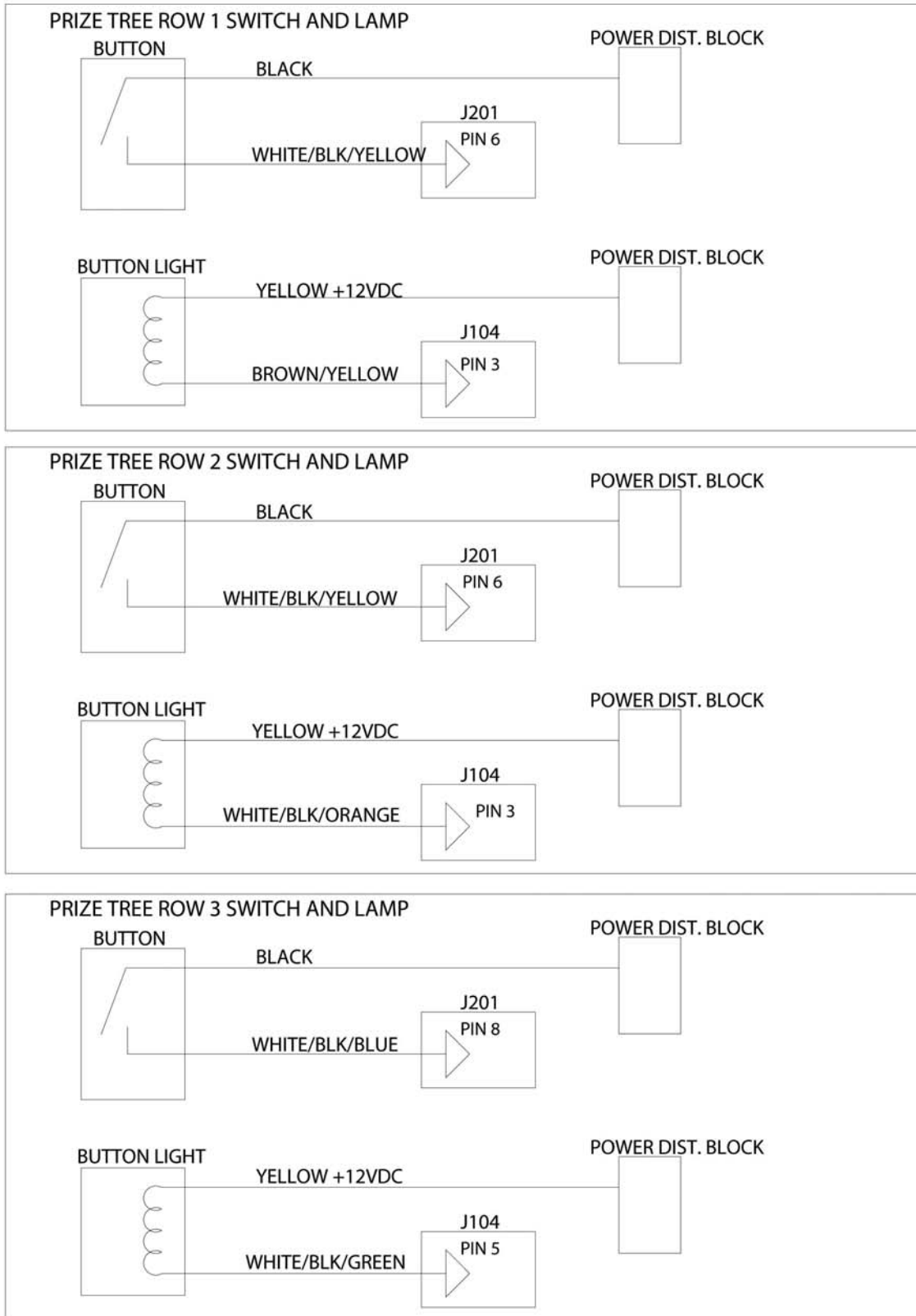


PRIZE DROP OPTO SENSORS



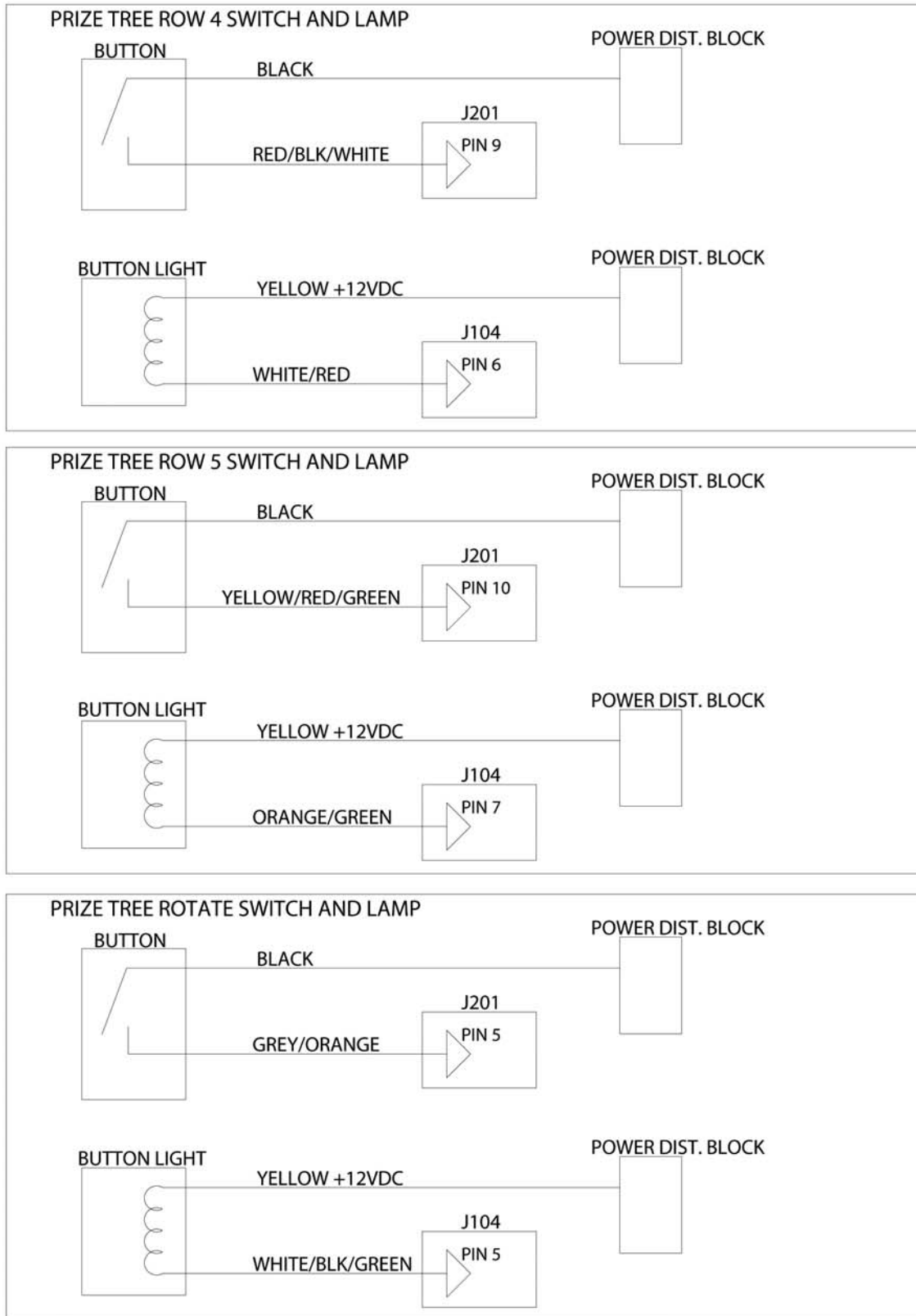
Schem-2
(28)

Schematic:



Schem-3
(29)

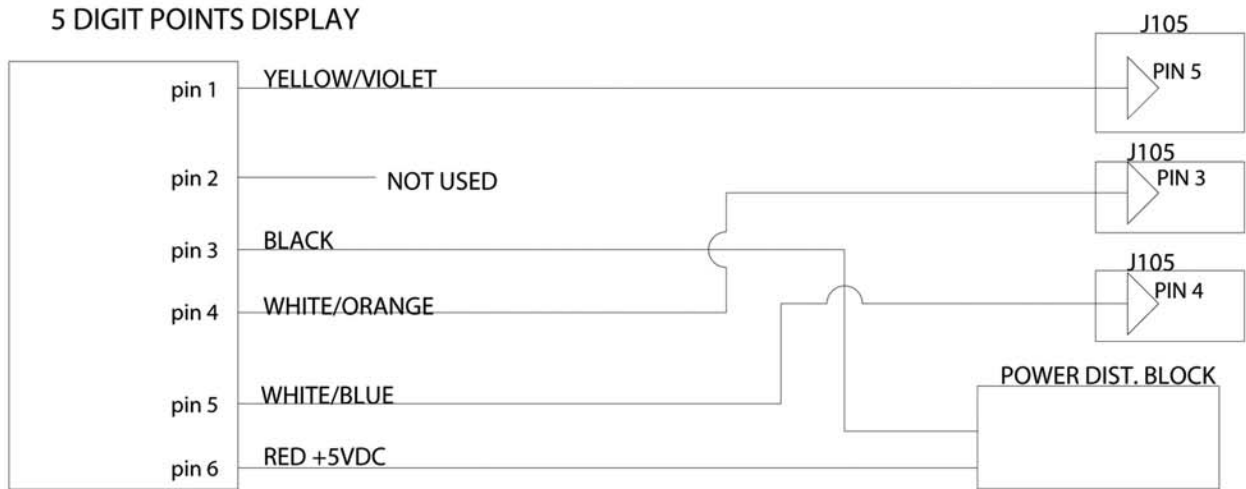
Schematic:



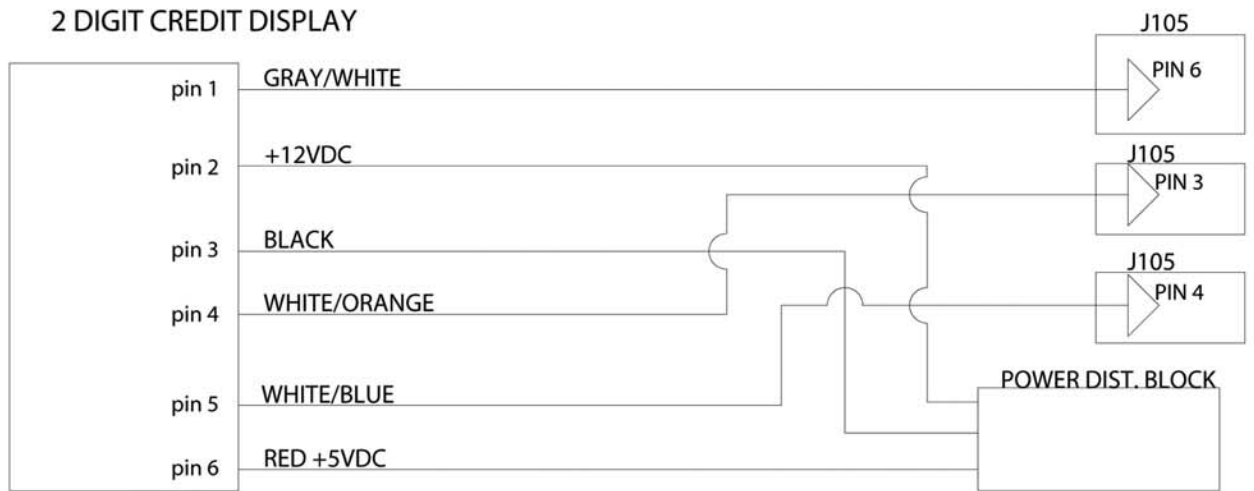
Schem-4
(30)

Schematic:

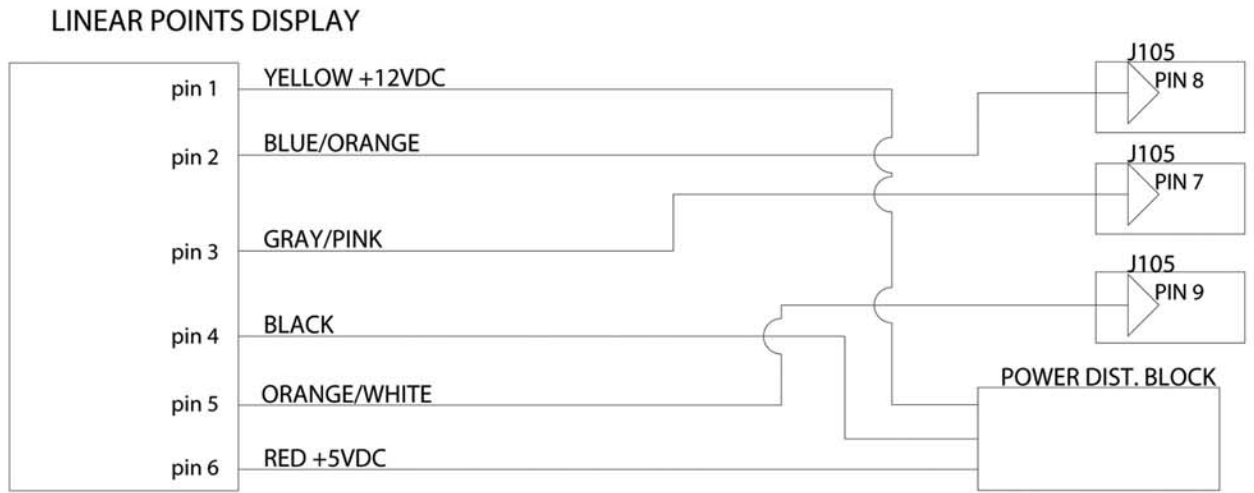
5 DIGIT POINTS DISPLAY



2 DIGIT CREDIT DISPLAY



LINEAR POINTS DISPLAY



Schem-5

(31)

Schematic:

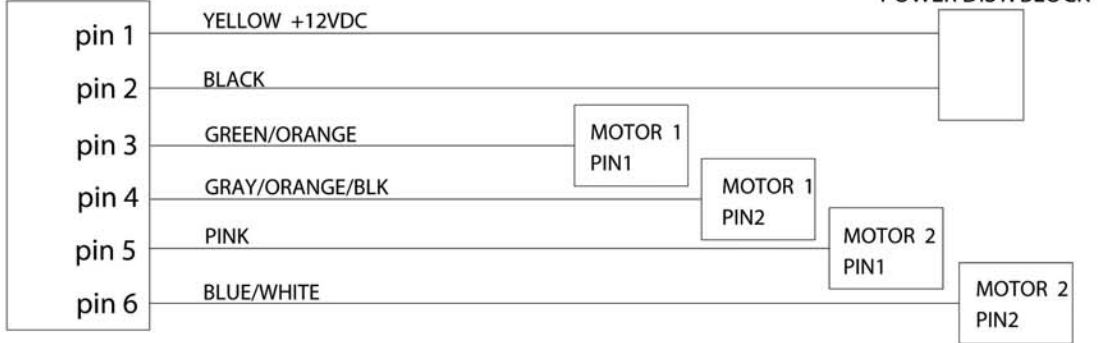
NOTE: DASH LINES DENOTE CONNECTOR. EG: →

3

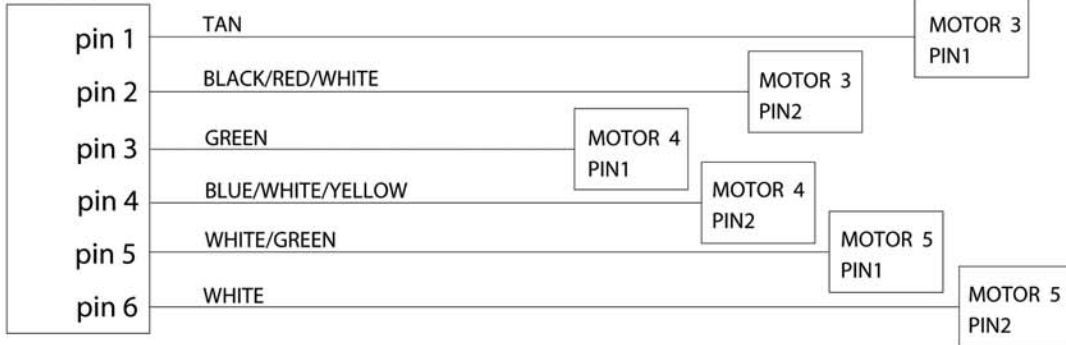
DC MOTOR CONTROLLER

NOTE: J1 AND J2 WIRES GO THROUGH MULTIPLE CONNECTORS

J2 CONNECTION



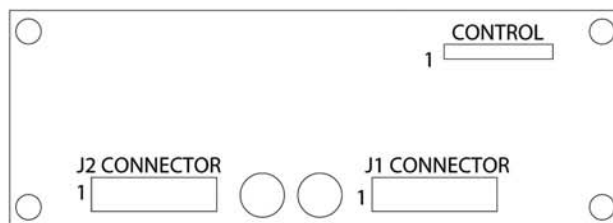
J1 CONNECTION



CONTROL

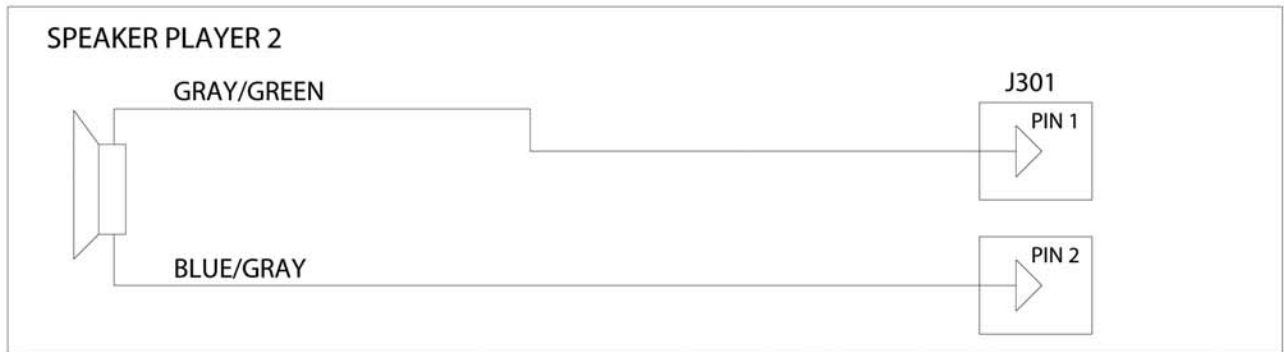
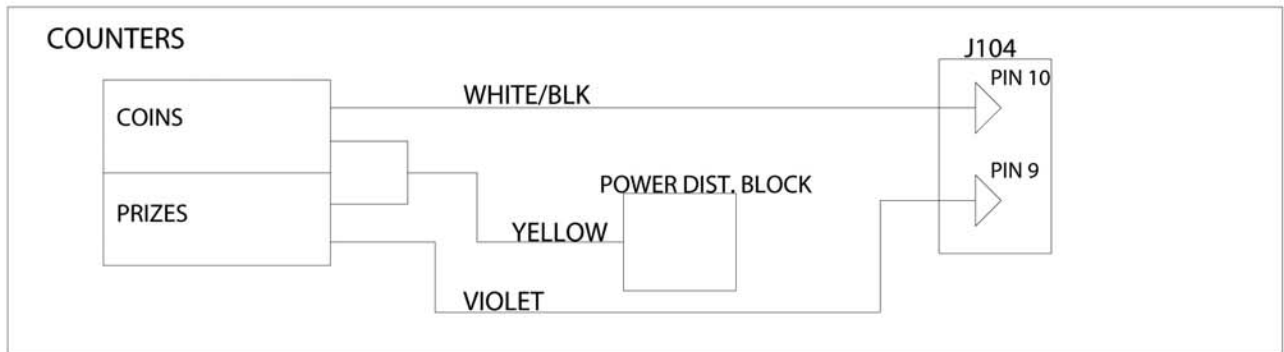


DC MOTOR CONTROLLER BOARD

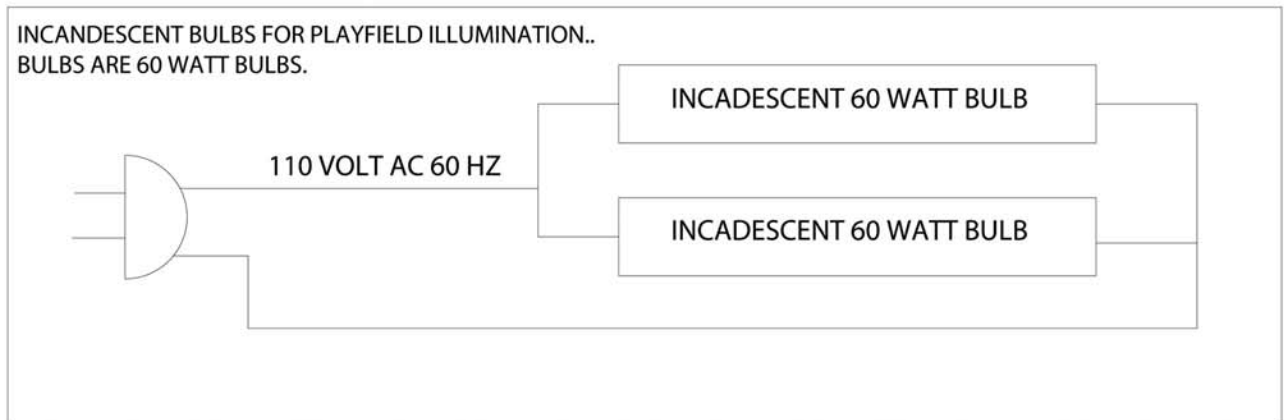
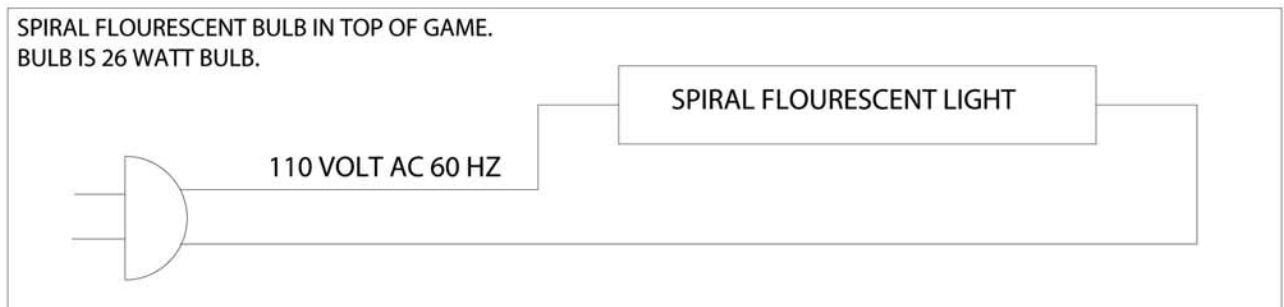


Schem-6
(32)

Schematic:



NOTE: THIS DIAGRAM IS FOR 110 VOLT OPERATION ONLY.

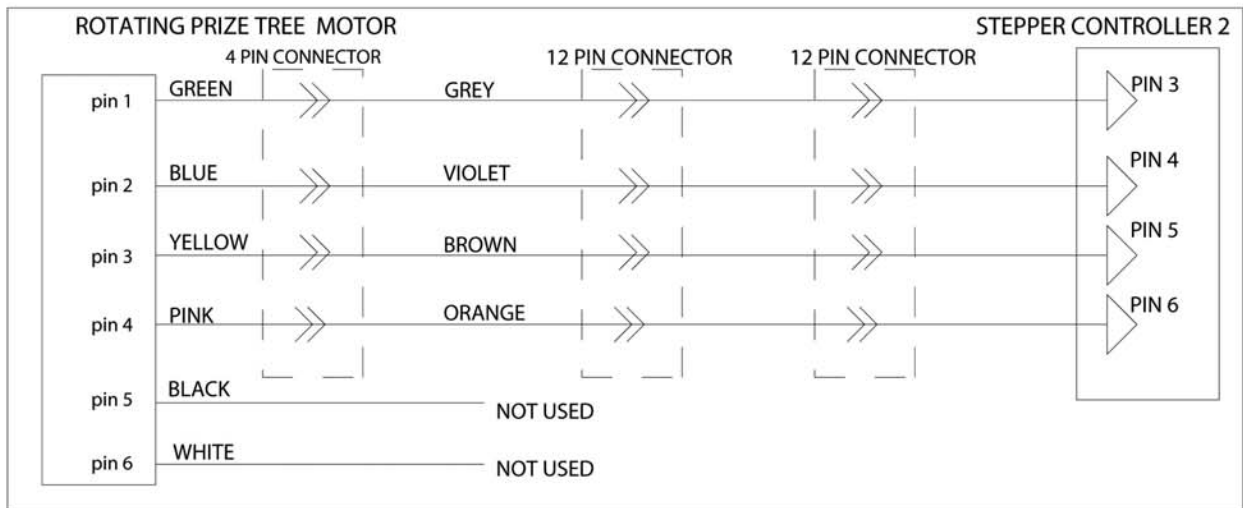
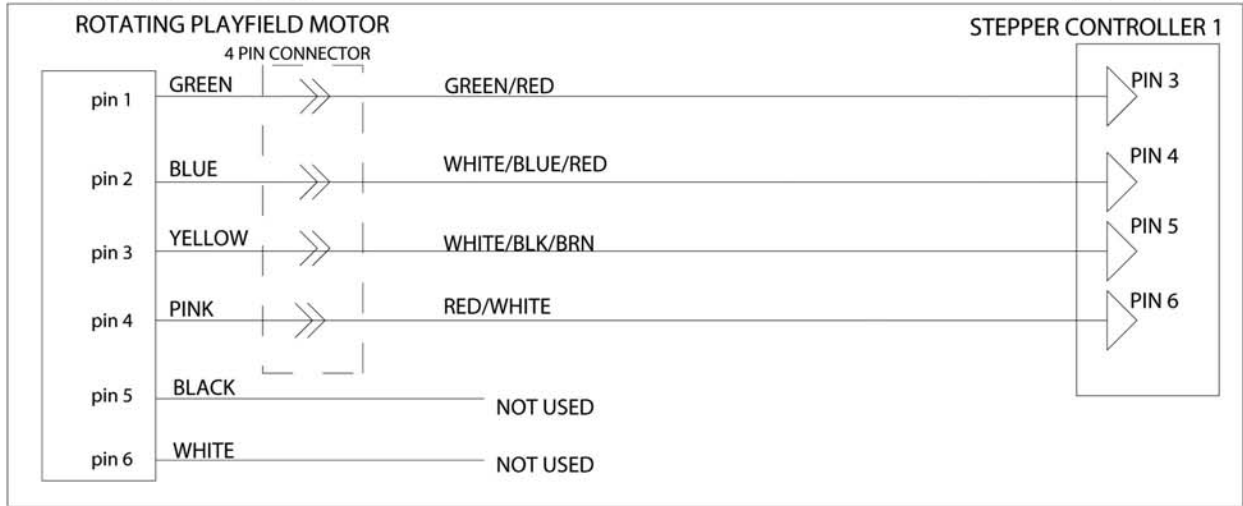


Schem-7

(33)

Schematic:

NOTE: DASH LINES DENOTE CONNECTOR. EG: → [3]

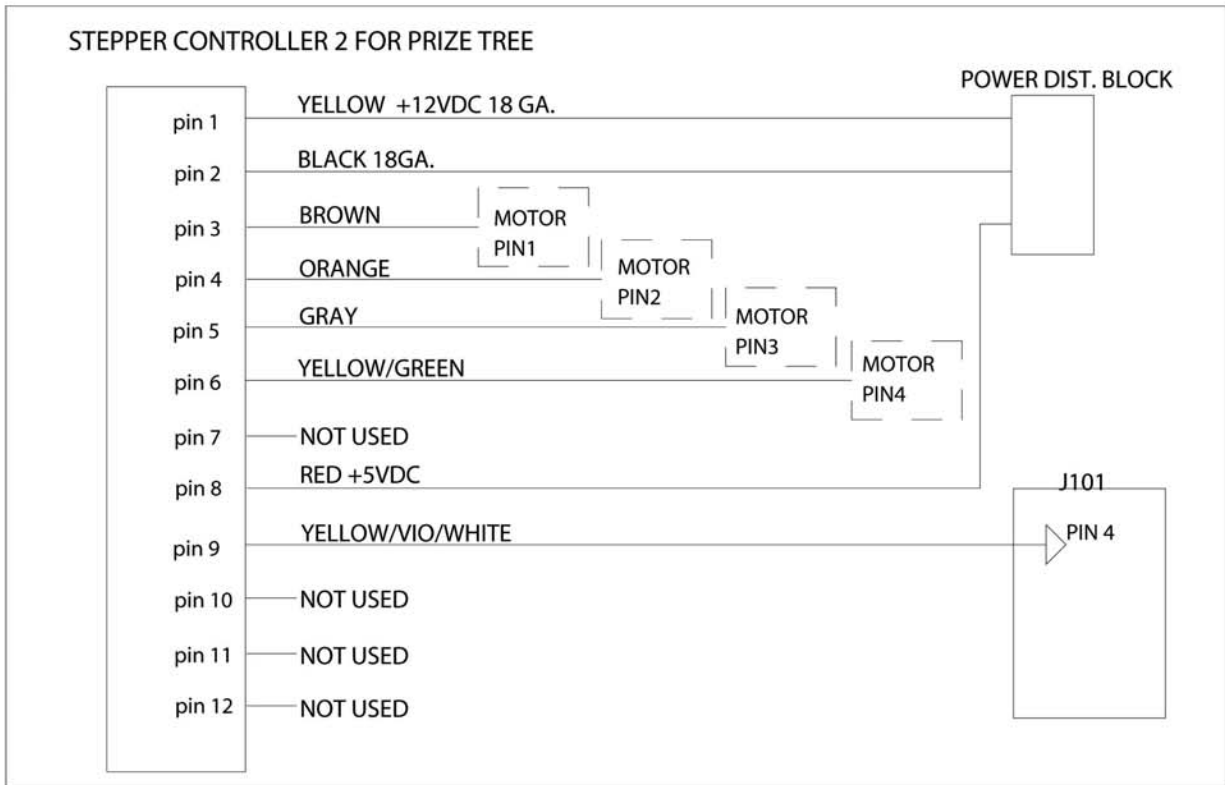
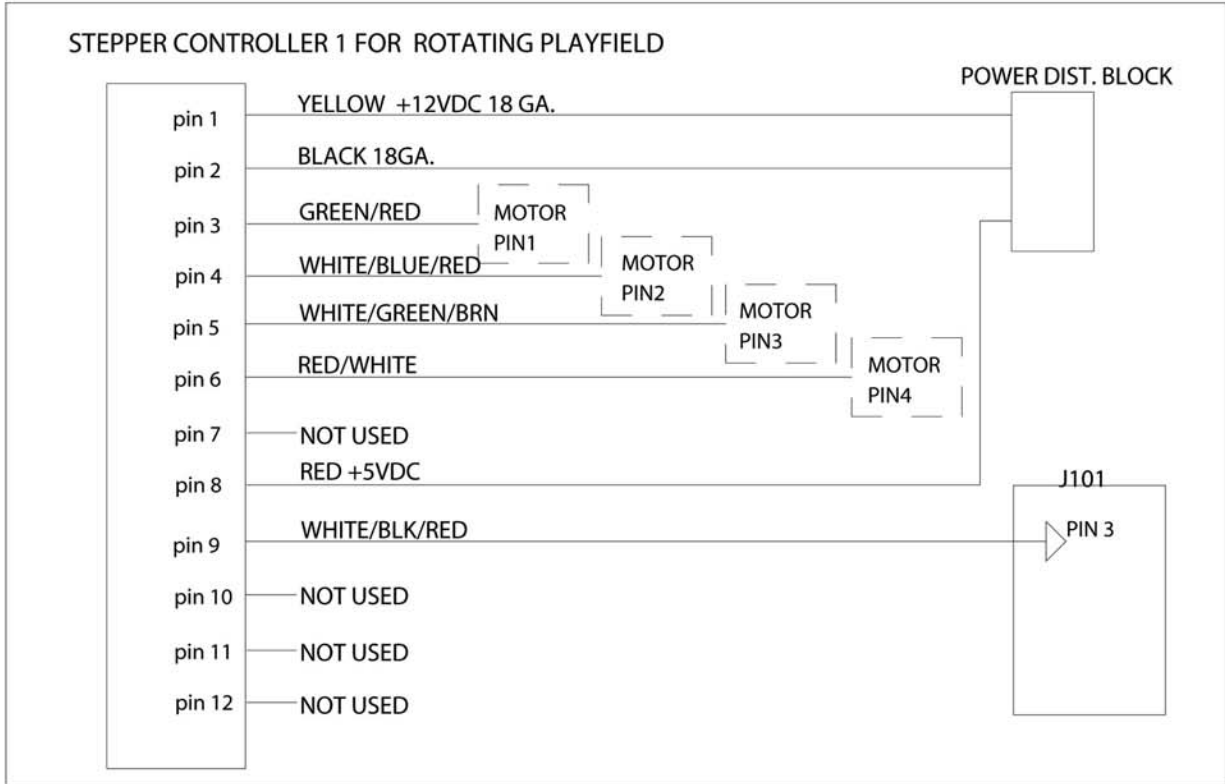


Schem-8

Schematic:

NOTE: DASH LINES DENOTE CONNECTOR. EG: →

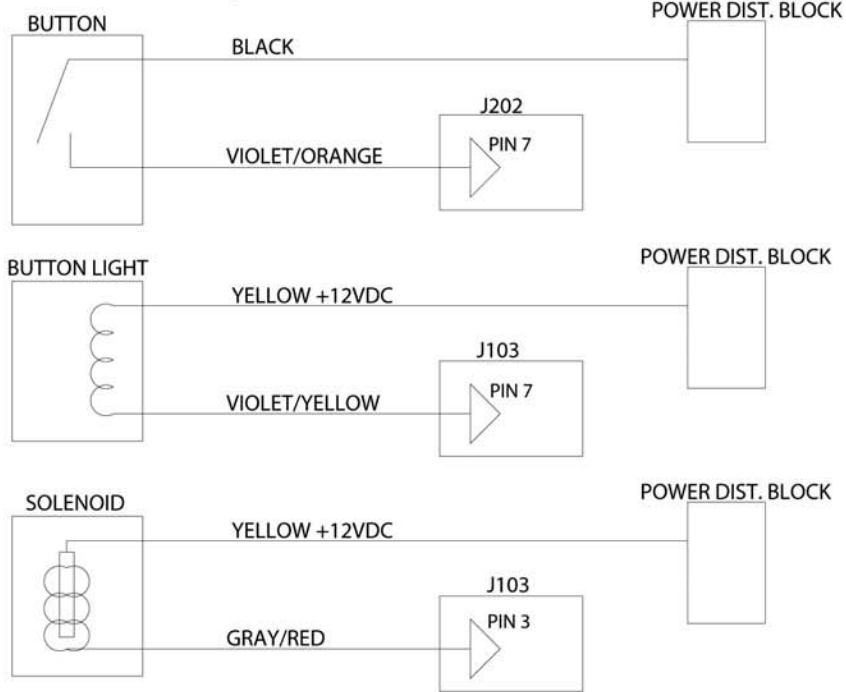
3



Schem-9
(35)

Schematic:

PRIZE DOOR 1 SWITCH, LAMP AND SOLENOID

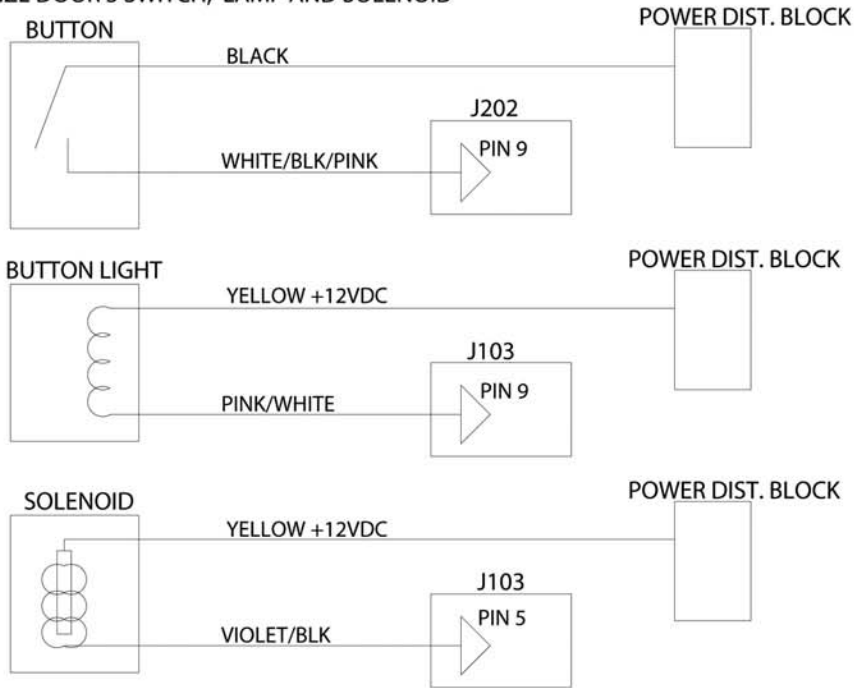


PRIZE DOOR 2 SWITCH, LAMP AND SOLENOID



Schematic:

PRIZE DOOR 3 SWITCH, LAMP AND SOLENOID



PRIZE DOOR 4 SWITCH, LAMP AND SOLENOID

