

Operations Manual

StringPin Pinsetter

Ten Pin

August 2021 / 55-900004-000

Brunswick 

StringPin Pinsetter Operations Manual

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Manual Part No. 55-900004-000

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Section 1: SAFETY!

SAFETY

Notes & Warnings

Throughout this publication, “Warnings”, and “Cautions” (accompanied by one of the International HAZARD Symbols) are used to alert the mechanic to special instructions concerning a particular service or operation that may be hazardous if performed incorrectly or carelessly. They are defined below. **OBSERVE AND READ THEM CAREFULLY!**

These “Safety Alerts” alone cannot eliminate the hazards that they signal. Strict compliance to these special instructions when performing the service, plus training and “Common Sense” operation are major accident prevention measures.



NOTE or IMPORTANT!: Will designate significant informational notes.



WARNING!

Will designate a mechanical or nonelectrical alert which could potentially cause personal injury or death.



WARNING!

Will designate electrical alerts which could potentially cause personal injury or death.



CAUTION!

Will designate an alert which could potentially cause product damage.



Will designate grounding alerts.

SAFETY NOTICE TO USERS OF THIS MANUAL

This manual has been written and published by the Service Department of Brunswick Bowling Products to aid the reader when operating or troubleshooting the products described.

It is assumed that these personnel are familiar with, and have been trained in, the operating or troubleshooting procedures of these products, which includes the use of common mechanic's hand tools and any special Brunswick or recommended tools from other suppliers.

We could not possibly know of and advise the reader of all conceivable procedures by which a service might be performed and of the possible hazards and/or results of each method. We have not attempted any such wide evaluation. Therefore, anyone who uses a service procedure and/or tool, which is not recommended by Brunswick, must first completely satisfy himself that neither his nor the products safety will be endangered by the service procedure selected.

All information, illustrations and specifications contained in this manual are based on the latest product information available at the time of publication.

It should be kept in mind, while working on the product, that the electrical system is capable of violent and damaging short circuits or severe electrical shocks. When performing any work where electrical terminals could possibly be grounded or touched by the mechanic, the power to the product should be disconnected prior to servicing and remain disconnected until servicing is complete.

Section 1: General Safety Instruction

GENERAL SAFETY INFORMATION AND PROTECTIVE MEASURES

Safety Notes

Please observe the following procedures in order to ensure the correct and safe use of the Brunswick StringPin Pinsetter.

- The national/international rules and regulations apply to the installation, commissioning, use and periodic technical inspections of the StringPin Pinsetter system, in particular:
 - Machine Directive 98/37/EEC
 - Equipment Usage Directive 89/655/EEC
 - The work safety regulations/safety rules
 - Other relevant health and safety regulations
- The operating instructions must be made available to the user of the StringPin Pinsetter. The pinsetter operator is to be instructed in the use of the device by center mechanic and must be instructed to read the operating instructions.
- Users of the StringPin pinsetter are responsible for obtaining and observing all applicable safety regulations and rules.

FUNCTIONAL CHECK OF THE PROTECTIVE DEVICES

Emergency Stop (E-Stop) Switch

The StringPin Pinsetter has two emergency stop switches, one located at the front and the other located at the rear of the machine. These E-Stop switches are to be used if an emergency were to arise. Press the E-Stop switch to stop the machine immediately. The pins will slowly return to the home position from gravity. Periodically check to make sure that the E-Stop switches are functional by testing the switches on all machines.

Local Guarding

The StringPin Pinsetter has fixed and removable guarding installed to prevent injury, to limit access to moving parts of the pinsetter, and to provide temporary access for maintenance and troubleshooting. Periodically and immediately after pinsetter maintenance, check to make sure that all guarding is in place. If any guarding has been removed, properly replace it before operating the pinsetter.

DECLARATION OF CONFORMITY

Brunswick 

EC DECLARATION OF CONFORMITY



No.: CE-_____

Name of the manufacturer/authorized representative: **Brunswick Bowling Hungary Ltd.**

Address of the manufacturer/authorized: **8000 Székesfehérvár, Amerikai fasor 3.**

Object of the declaration: **StringPin Pinsetter**

Function of the equipment: **Bowling pinsetter machine**

Model identification: **StringPin**

Name and address of the person authorised to compile the technical file: **Jozsef Toth
Brunswick Bowing Hungary Ltd.
8000 Székesfehérvár, Amerikai fasor 3**

Distributed/Installed by: _____

Company Name: _____

Address: _____

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

- Directive **2006/42/EC** of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast)
- Directive **2006/95/EC** of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits
- Directive **2004/108/EC** of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC

References to the relevant harmonised standards used:

EN ISO 12100:2010	EN 349:1993+A1:2008
EN ISO 13849-1:2008	EN 953:1997+A1:2009
EN ISO 13850:2008	EN 1037:1995+A1:2008
EN ISO 13857:2008	EN ISO 14122-2:2001
EN 60204-1:2006/AC:2009	EN ISO 14122-3:2001

Manufacturer/authorized representative:

Certifies the installation is in conformity with the applicable standards:

Location: Székesfehérvár, Hungary

Location: _____

Date: June 1, 2015

No. CE-_____ Date: _____

Name: Jozsef Toth

Name: _____

Function: General Manager,

Function: _____

Signature: 

Signature: _____

This declaration of conformity is issued under the sole responsibility of the manufacturer
ATTENTION! This declaration refers exclusively to the issued condition of the machine and neither does this declaration refer to those parts which have been added to the machine, nor to such operations that are executed by the user after the issue

SAFETY GUIDELINES FOR STRINGPIN PINSETTERS

As with all machinery, a certain amount of risk is involved in working on the StringPin Pinsetter. However, if the necessary care, knowledge and responsibility are exercised, damage to the pinsetter and accidents involving people can be avoided. The following steps should be taken:

1. ONLY PROPERLY TRAINED PEOPLE ARE QUALIFIED TO WORK ON OR OPERATE THE PINSETTER.
2. Never operate the pinsetter without ALL factory supplied guarding in place.
3. Never operate the pinsetter if a guard or safety device is damaged or improperly fitted to the machine.
4. Never bypass, disable, or tamper with the safety switches or pinsetter function switches.
5. Never attempt to climb over or around any mechanical barrier or machine guard.
6. Reinstall all the machine guards and the ladder after any troubleshooting or maintenance work has been done on the pinsetter(s) or ball accelerator.
7. Always face toward the machine when using the ladder to climb onto or off the machine. Only one person should be on the ladder at any time.
8. Suitable clothing must be worn (for example: rubber-soled shoes). Do not wear loose clothing such as neckties or smocks that could get caught in moving parts. Remove rings, watches, earrings, bracelets and other jewelry to avoid injury.
9. Care should be taken while near the front of the machine. Accidentally blocking the photocell beam will cause the pinsetter to cycle.
10. Always turn the pinsetter off before working on the machine. Use the Stop/Run Switches mounted on the rear or front of the pinsetter to turn off the pinsetter.
11. If more than one person is working on a machine or if a stop/run switch will be out of reach while working on the machine, turn off both stop/run switches to prevent a person from turning on the pinsetter before the other person says he/she is clear of the pinsetter.
12. When working on both machines of a lane pair or components that are common to both machines (for example: the ball accelerator) power must be turned off at the StringPin Pinsetter Controller. In addition, the main power switch on the StringPin Controller must be locked into the off position using a suitable locking mechanism.
13. Fire extinguishers must be on hand and maintained properly. Keep oily rags and other combustibles in approved fire proof containers.
14. If more than one person is working on a machine, be sure the other person is CLEAR before restarting the machine.
15. When working in the pinsetter area while machines are in operation, ear protection should be worn. Sound levels greater than 83db can be experienced within 1.6 meters of operating machines.

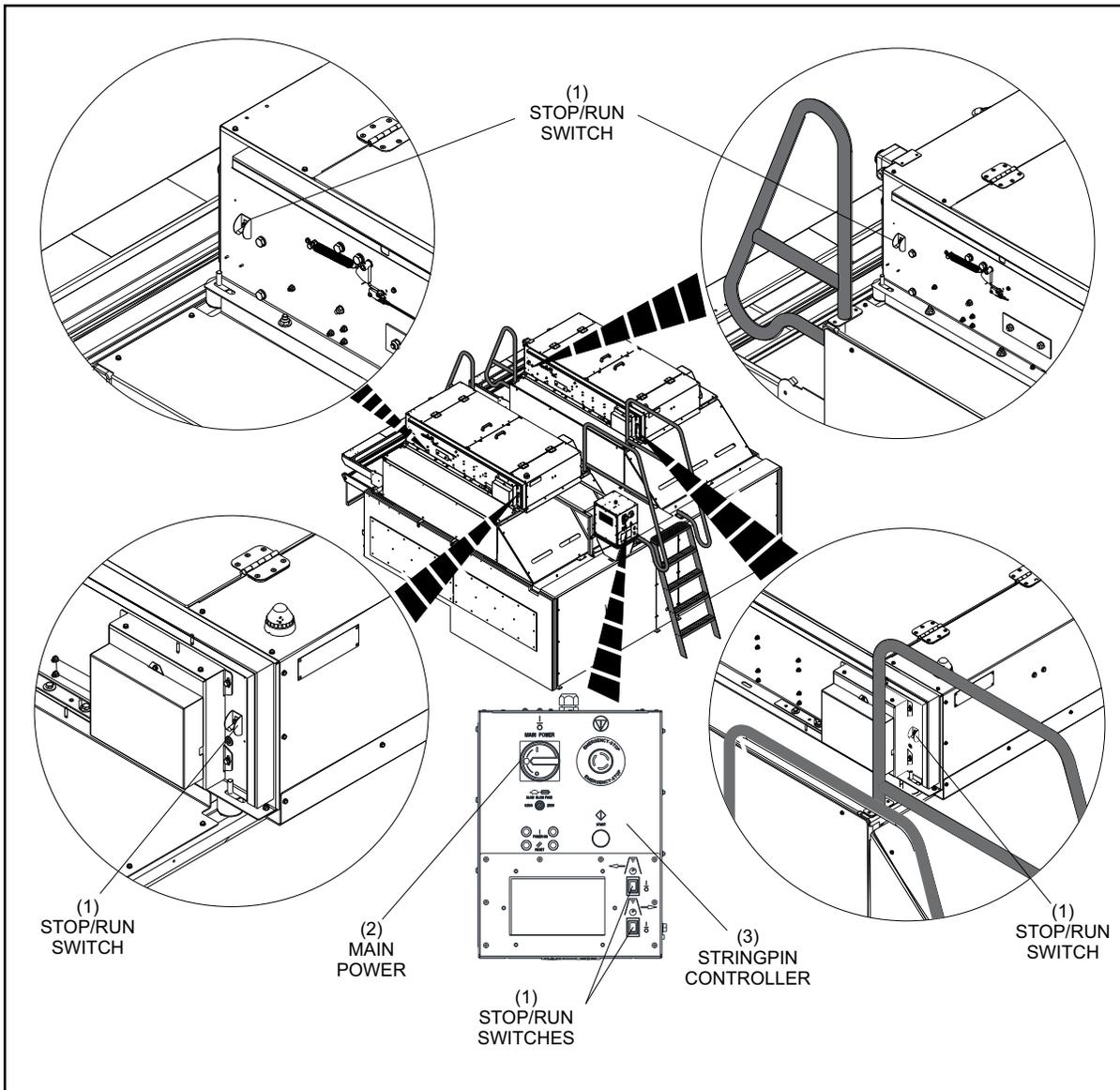
16. Never work on or around the pinsetter while under the influence of alcohol, drugs, or any other substance that can impair your physical abilities or mental judgment.
17. Always use the correct tools for the job.
18. The StringPin pinsetter is designed for use as a 10 pin bowling machine. Do not use the machine or any of its subassemblies for any other purpose.
19. Poisonous or toxic cleaners must not be used. Always check the material safety data sheets before using new cleaners.
20. Always use factory approved parts when repairing the pinsetter. Using substandard parts may pose a safety risk.
21. Always make sure that a bowler is not positioned to throw a ball before putting yourself between the bowler and the machine. It is good practice to have another employee positioned near any bowler to ensure they cannot throw a ball. Additionally, make sure to properly secure a Brunswick Ball Stop or similar 3rd party product to the lane between you and the bowler for added protection.

Section 2: StringPin Machine Overview

OPERATION AND CYCLES

Turning the Pinsetter On/Off

The pinsetter can be turned on/off using the Stop/Run switches located at the back or front of each individual machine or on the String Pin Controller box. **Always turn the Pinsetter off before working on the machine.** If internal service work is to be performed, turn off the main power switch and use an approved lockout device on the main power switch to prohibit the machine from being turned on. Refer to figure titled *Pinsetter On/Off Control*.



Pinsetter On/Off Control

- (1) LEFT/RIGHT STOP/RUN SWITCH (2) MAIN POWER (3) STRINGPIN CONTROLLER

Actions That Start a Machine Cycle

Any of the following occurrences will cycle the pinsetter.

1. Pushing the reset button on the ball rack.
2. The pulling of a string attached to a pin such as when a bowling ball knocking over one or more pins along with a ball detect signal from the pinsetter ball detector.
3. The second ball in a frame breaking the pinsetter ball detector.
4. Switching the main power located on the StringPin Controller to the “On” position.
5. The scoring system sending the pinsetter a “Reset” command through its communication cable.

Description of Pinsetter Cycles During Bowling

First Ball Cycles

Strike

Three seconds after the first pin falls, all ten pins are raised to the full up position and then lowered to the pindeck.

Gutter Ball

The machine will receive and remember the ball detect signal. There is no machine activity and after five seconds the machine is ready for the second ball.

Some Pins Knocked Down (Standing Pin Cycle)

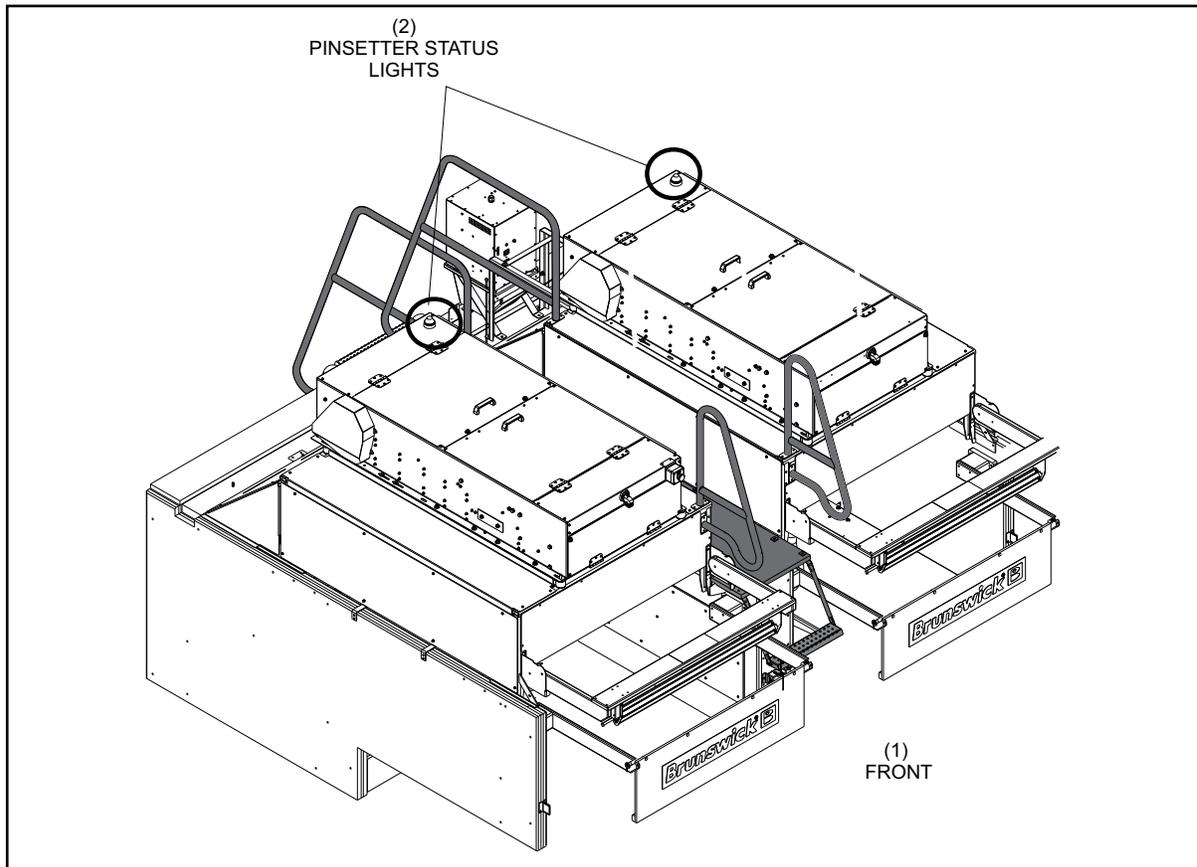
Three seconds after the first pin falls, all ten pins are raised to the full up position and those that were left standing will be lowered to the pindeck.

Second Ball Cycles

Three seconds after receiving a ball detector signal all ten pins are raised to the full up position and then lowered to the pindeck.

PINSETTER STATUS LIGHT/MACHINE POWER ON SEQUENCE

The white light located on top of the StringPin pinsetter provides the operator with valuable information concerning the state of the machine. Refer to the figures titled *StringPin Pinsetter Status Light Location* and *StringPin Pinsetter Status Light*.

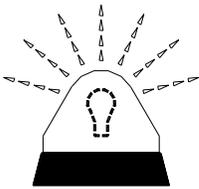


StringPin Pinsetter Status Light Location

(1) FRONT

(2) PINSETTER STATUS LIGHTS

StringPin Status Light Sequence

 A light bulb icon with a dashed outline and several short, dashed lines radiating from the top, indicating rapid flashing.	<p>Rapid-flashing white light indicates the pinsetter is GETTING READY TO RUN. Stay clear of machine & keep guards in place</p>
 A light bulb icon with a dashed outline and several short, solid lines radiating from the top, indicating slow flashing.	<p>Slow-flashing white light indicates an error has occurred. The pinsetter needs attention. Turn machine off and lock out power before servicing.</p>
 A light bulb icon with a solid outline and several long, solid lines radiating from the top, indicating a solid light.	<p>Solid white light indicates the pinsetter is READY TO RUN. A signal from a remote location will cause the pinsetter to start WITHOUT WARNING. Stay clear of machine. Keep guards in place.</p>
 A light bulb icon with a solid outline and no radiating lines, indicating the light is off.	<p>No light indicates the pinsetter is off. Safe to Service. Lock out power before servicing.</p>

StringPin Pinsetter Status Light

PINSETTER GUARDING

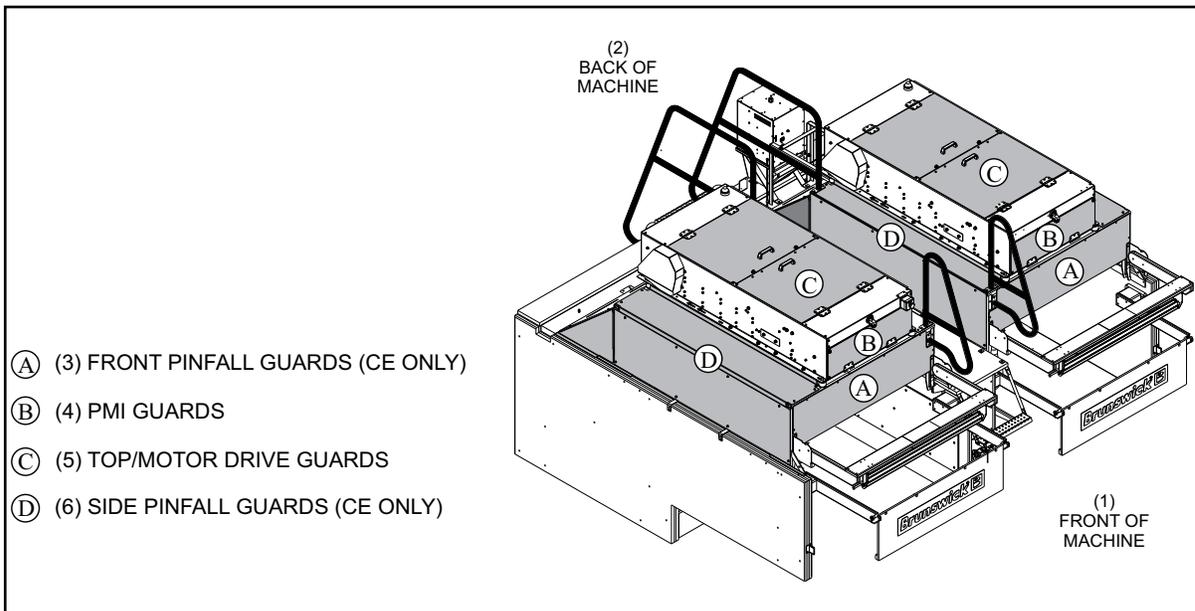
The StringPin Pinsetter is equipped with guards to prevent injury and to limit access to moving parts of the pinsetter. Two guarding options are available; UL certified and CE Certified. UL Certified guarding is the standard guarding for centers outside the European Union while CE Certified guarding is required for centers in European Union countries as well as all residential installations.



Brunswick strongly encourages all centers to consider upgrading to Brunswick's CE Certified guarding.



WARNING! Do not operate the pinsetter without the guarding in place. Severe injury could result if the pinsetter guarding is not used while the machine is operating.

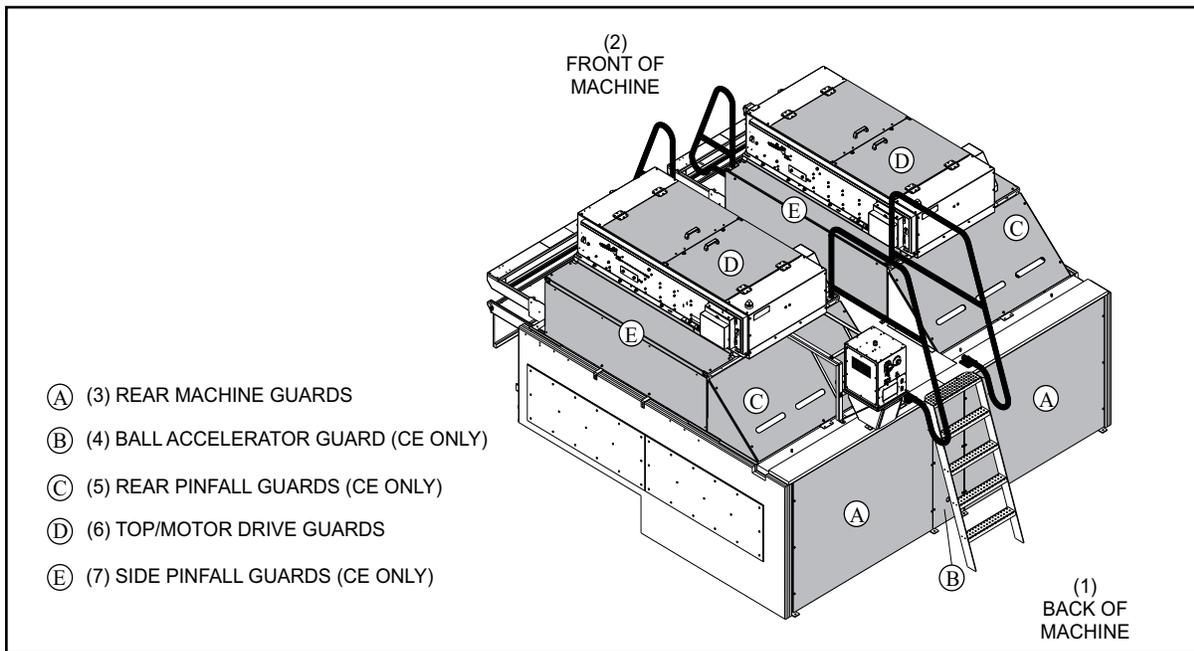


Guarding (Front)

(1) FRONT OF MACHINE
(4) PMI GUARDS

(2) BACK OF MACHINE
(5) TOP/MOTOR DRIVE GUARDS

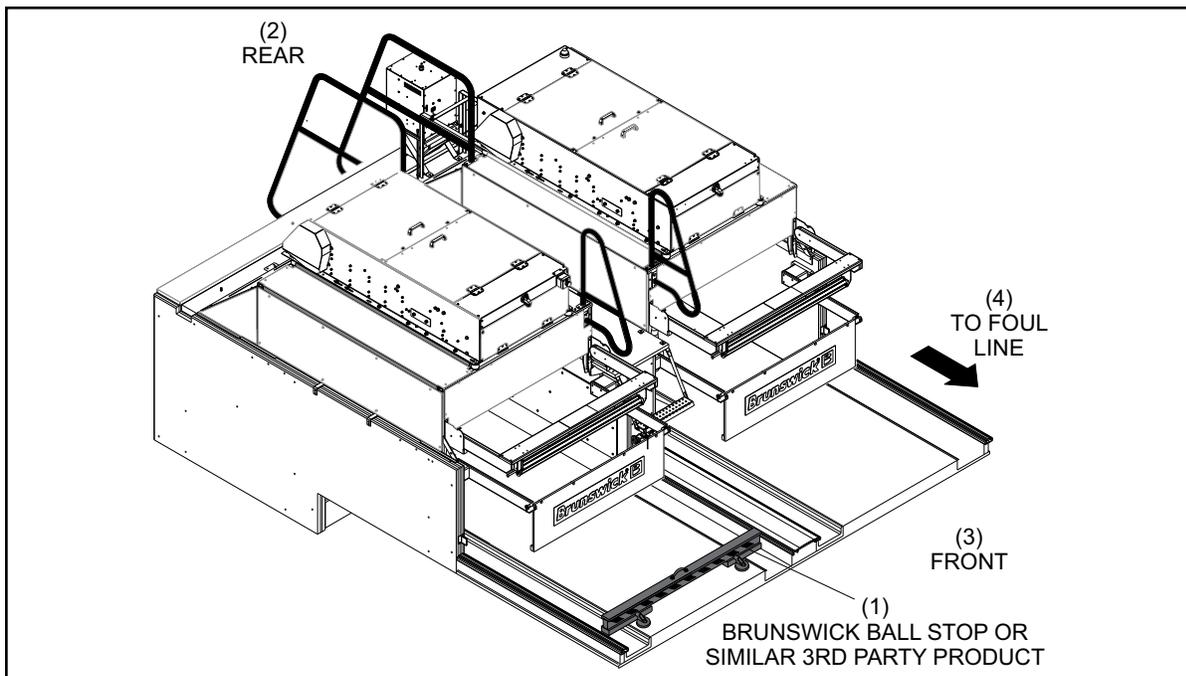
(3) FRONT PINFALL GUARDS (CE ONLY)
(6) SIDE PINFALL GUARDS (CE ONLY)



Guarding (Rear)

- | | | |
|--------------------------------------|-----------------------------------|----------------------------|
| (1) BACK OF MACHINE | (2) FRONT OF MACHINE | (3) REAR MACHINE GUARDS |
| (4) BALL ACCELERATOR GUARD (CE ONLY) | (5) REAR PINFALL GUARDS (CE ONLY) | (6) TOP/MOTOR DRIVE GUARDS |
| (7) SIDE PINFALL GUARDS (CE ONLY) | | |

To prevent a ball from impacting the mechanic or operator during maintenance, place a Brunswick Ball Stop or similar 3rd Party Product on the lane. Secure it properly in place between the bowler and the mechanic/operator. Refer to the figure labeled *Brunswick Ball Stop/3rd Party Product*.

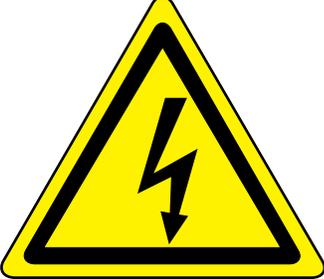


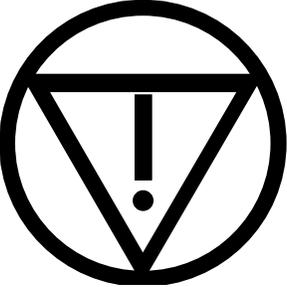
Brunswick Ball Stop/3rd Party Product

- | | | |
|--|----------|-----------|
| (1) BRUNSWICK BALL STOP OR 3RD PARTY PRODUCT | (2) REAR | (3) FRONT |
| (4) TO FOUL LINE | | |

PINSETTER GUARD LABELS AND SYMBOLS

The StringPin pinsetter may have guard labels that are installed to alert the operator of various electrical and mechanical warnings throughout the pinsetter. Additionally, various symbols will be found designating many different functions. Review the following chart for an explanation of all labels and symbols.

Warning/Symbol	Definition
	<p style="text-align: center;">High Voltage and/or Electrical Warning</p> <hr style="width: 20%; margin: auto;"/> <p style="text-align: center;">Indicates electrical areas which could potentially cause personal injury or death</p>
	<p style="text-align: center;">Mechanical Warning</p> <hr style="width: 20%; margin: auto;"/> <p style="text-align: center;">Indicates mechanical areas which could potentially cause personal injury or death</p>
	<p style="text-align: center;">Pinch Point Warning</p> <hr style="width: 20%; margin: auto;"/> <p style="text-align: center;">Indicates pinch point areas which could potentially cause personal injury or death</p>
	<p style="text-align: center;">Lock Out</p> <hr style="width: 20%; margin: auto;"/> <p style="text-align: center;">Indicates a reminder to turn off AND lock out the pinsetter power before servicing</p>
	<p style="text-align: center;">Emergency Stop</p> <hr style="width: 20%; margin: auto;"/> <p style="text-align: center;">Indicates emergency stop(s) and direction to rotate the E-Stop push button to return power to the pinsetters</p>

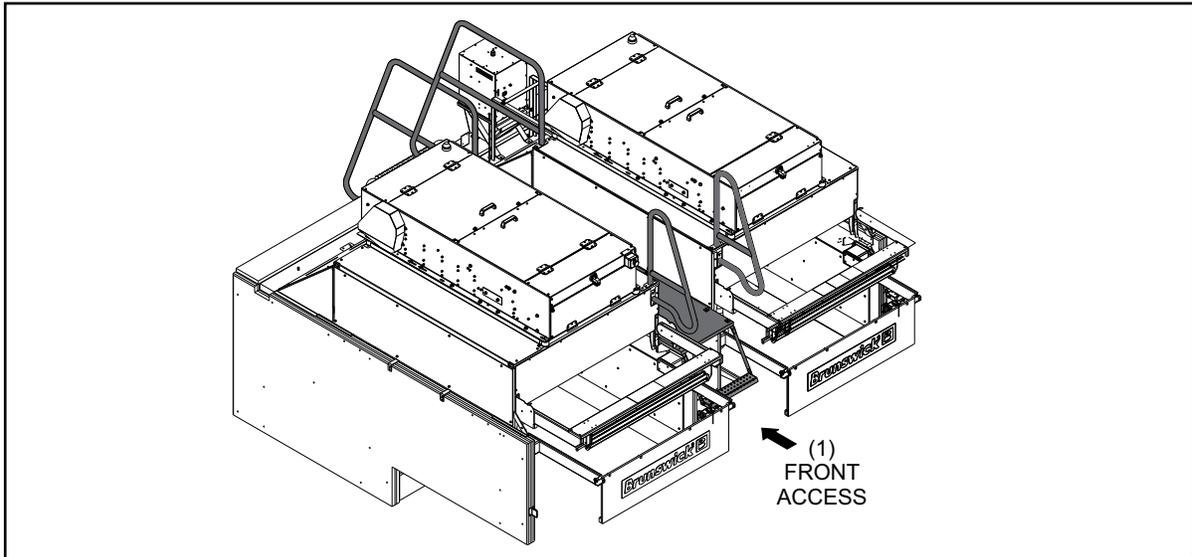
Warning/Symbol	Definition
	<p>General Emergency Stop</p> <hr/> <p>Indicates the location of a general emergency stop switch</p>
	<p>Run or Stop</p> <hr/> <p>Indicates the location of a run or stop switch that can be used to turn one pinsetter on or off</p>
	<p>Do Not Step</p> <hr/> <p>Indicates an area that is not designed to step on or used as a step</p>
	<p>Do Not Stand</p> <hr/> <p>Indicates an area that is not designed to stand on</p>
	<p>Do Not Sit</p> <hr/> <p>Indicates an area that is not designed to be used as a seating area</p>

PINSETTER ACCESS POINTS

It may become necessary to enter the pinsetter to perform maintenance tasks or correct a problem with the machine. If entering the pinsetter is needed, only enter using the locations as shown in the Pinsetter Access Points section. The Access Points are highlighted in the following figures. Refer to the figures titled *Machine Front Access* and *Machine Rear Access*.



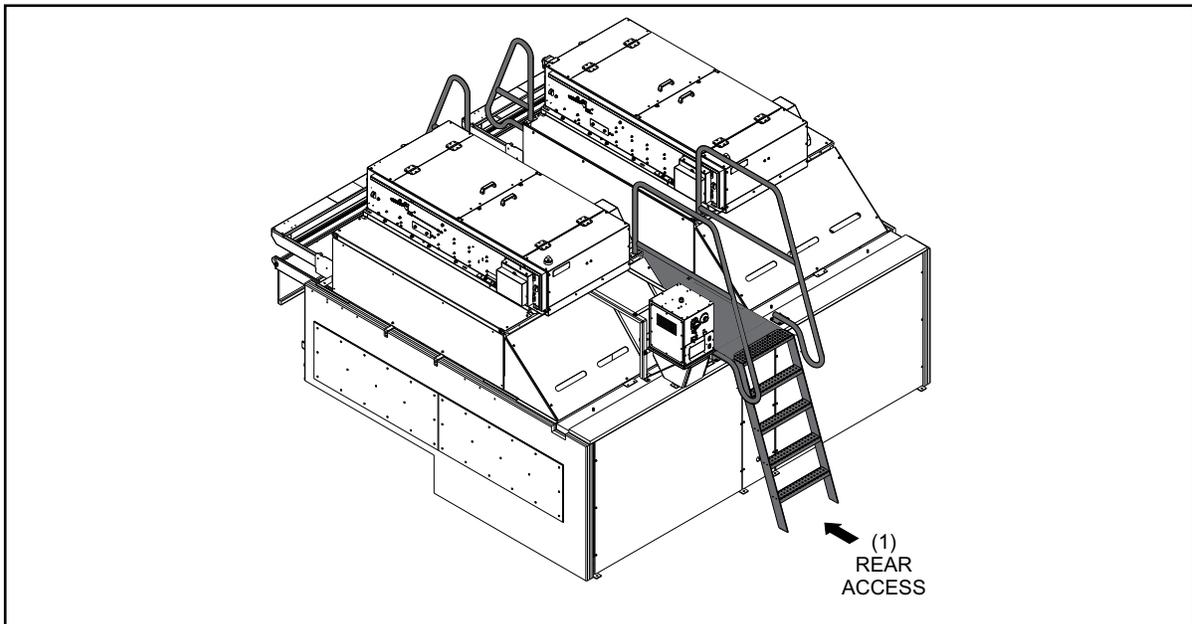
CAUTION: Only use the access points as recommended.



Machine Front Access

(1) MACHINE FRONT ACCESS

i **NOTE:** Always face toward the machine when using a pinsetter ladder to climb onto or off the machine. Only one person should be on the ladder at any time.



Machine Rear Access

(1) REAR ACCESS

WORK AREAS

The operation, maintenance, and repair of the StringPin can be accomplished using three defined work areas or locations, as defined from the most to least frequently used. The areas include:

Area 1 - Floor

Area 2 - Ball Accelerator and Standing Platforms

Area 3 - Pin Deck



CAUTION: When accessing work areas 2 and 3, the main power switch on the StringPin Controller must be locked in the off position using a suitable locking mechanism.

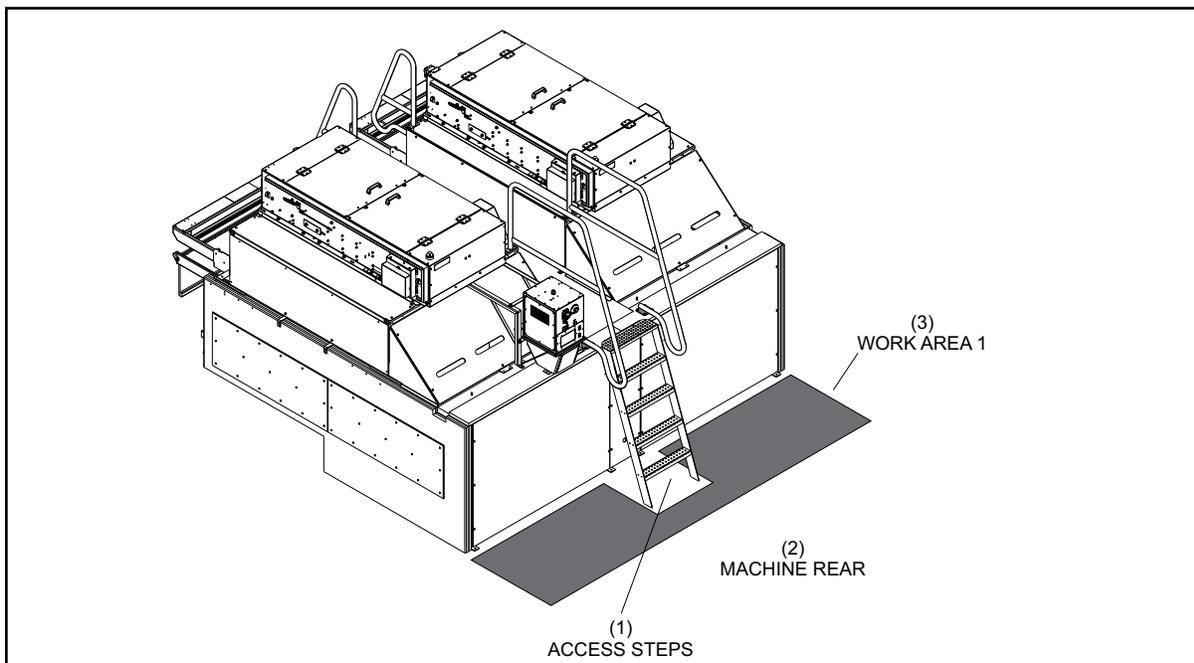


CAUTION: When accessing work area 3, make sure to properly secure a Brunswick Ball Stop or similar 3rd party product to the lane between you and the bowler for added protection.

Work Area 1- Floor

The most frequent area used for operating and maintaining the pinsetter is the floor area behind the pinsetters. During operation, all machine activity can be observed from this location. Additionally, the rear mounted StringPin Controller can be easily accessed from Work Area 1. Refer to the figure titled *Machine Work Area*. This area may be used for such activities as:

1. Correcting Ball Return Stops - Ball Accelerator
2. Respotting Pins



Machine Work Area - Floor

(1) ACCESS STEPS

(2) MACHINE REAR

(3) WORK AREA 1

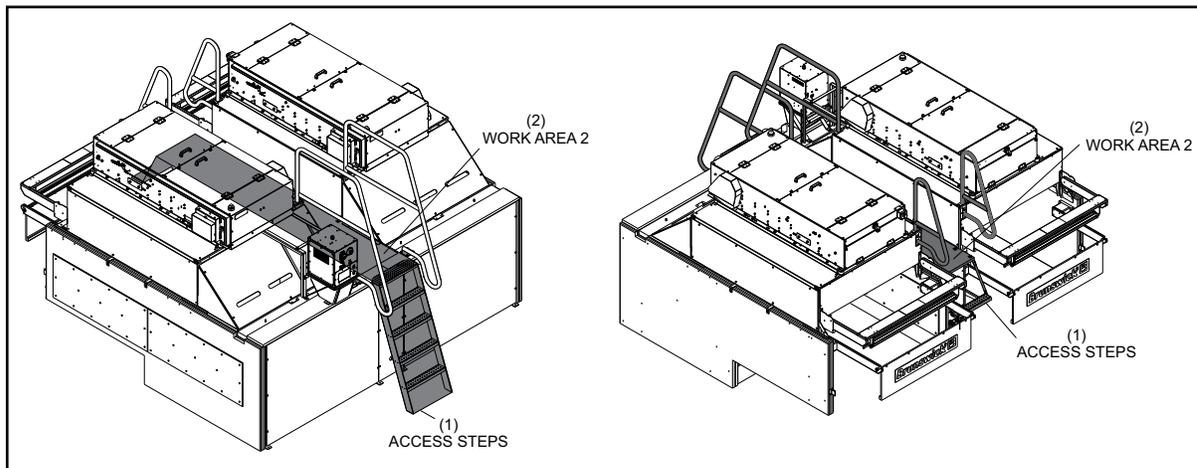
Work Area 2 - Ball Accelerator and Standing Platforms

Infrequently, a pinsetter stop or maintenance requires access further into the machine. For situations that cannot be performed from Work Area 1, Work Area 2 can be used. Refer to the figures titled *Machine Work Area 2 - Ball Accelerator/Standing Platforms (Rear - Front)* and *Machine Work Area 2 - Ball Accelerator and Standing Platforms (Top)*. This area may be used for such activities as:

1. Correcting Pinspotting Issues
2. Correcting Ball Return Stop - Pit Area

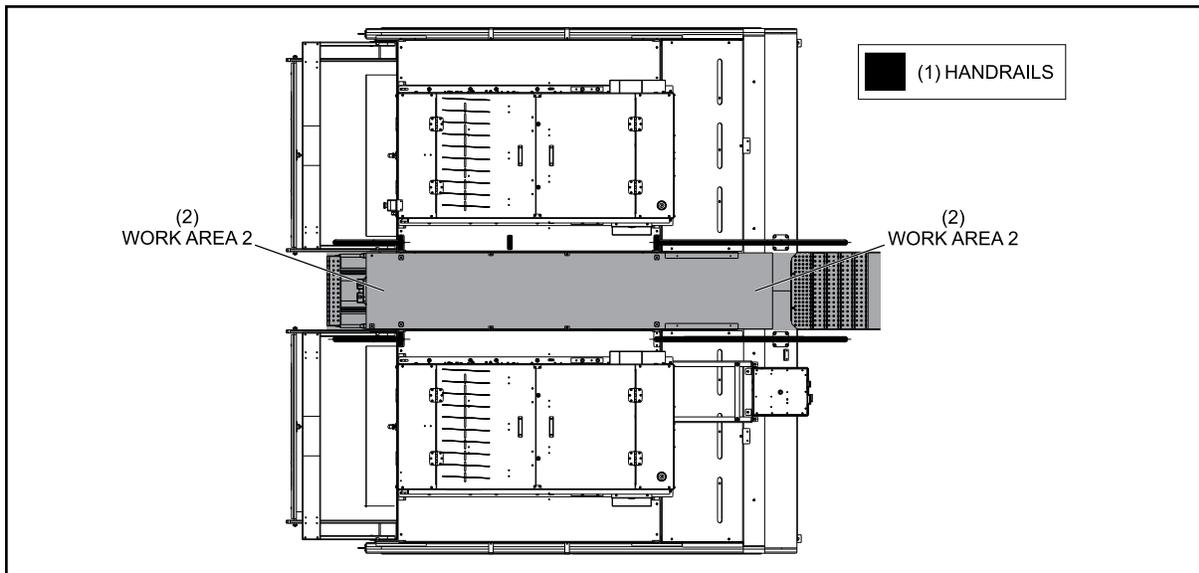


CAUTION: When accessing Work Area 2, the main power switch on the StringPin Controller must be locked in the off position using a suitable locking mechanism



Machine Work Area 2 - Ball Accelerator and Standing Platforms (Rear Front)

- (1) ACCESS STEPS (2) WORK AREA 2 (3) MACHINE POSITION (REAR)
(4) MACHINE POSITION (FRONT)



Machine Work Area 2 - Ball Accelerator and Standing Platforms (Top)

(1) HANDRAILS

(2) WORK AREA 2

Work Area 3 - Pindeck

Rarely, a pinsetter stop or maintenance requires access further into the machine. For situations that cannot be performed from Work Areas 1 or 2, Work Area 3 can be used. Refer to the figure titled *Machine Work Area 3 - Pin Deck Side View* for the work area. This area may be used for such activities as:

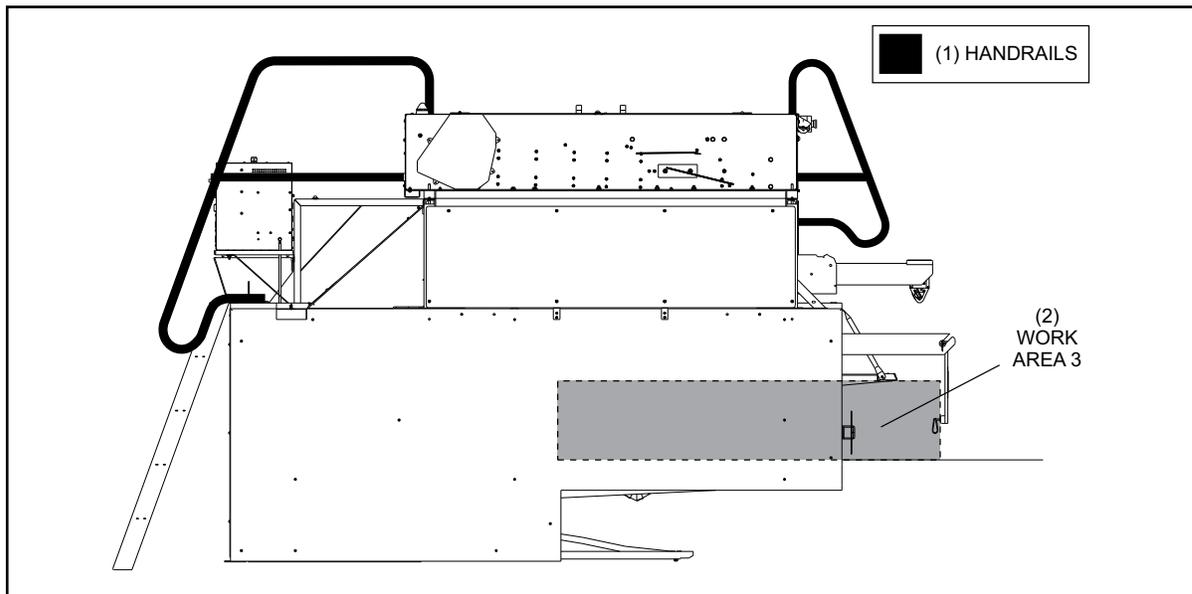
1. Detangling Pins
2. Correcting Ball Return Stop - Pin Deck



CAUTION: When accessing Work Area 3, the main power switch on the StringPin controller must be locked in the off position using a suitable locking mechanism.



CAUTION: Detangling pins and/or addressing a ball return stop places the mechanic between the bowler and the machine. Place and properly secure a Brunswick Ball Stop or similar 3rd Party Product between the bowler and the mechanic. Additionally, make sure that a bowler is not positioned to throw a ball before putting yourself between the bowler and the machine. It is a good practice to have another employee positioned near any bowler to ensure they cannot throw a ball and/or place a sign on the approach to indicate the lane is not available for bowling.



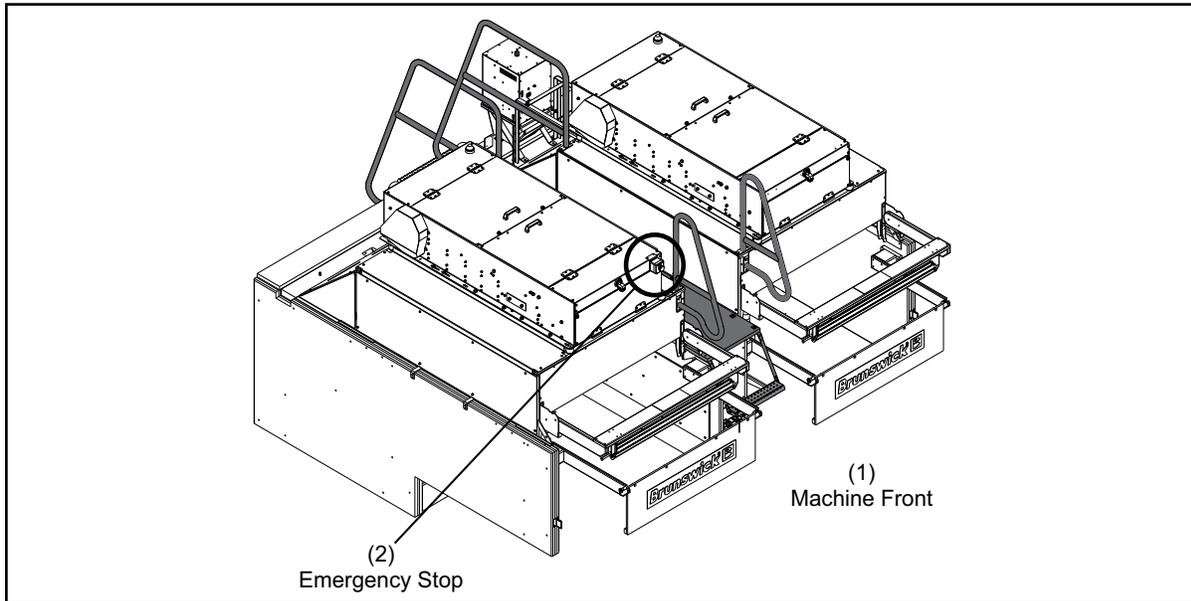
Machine Work Area 3 - Pin Deck Side View

(1) HANDRAILS

(2) WORK AREA 3

EMERGENCY STOP (E-STOP)

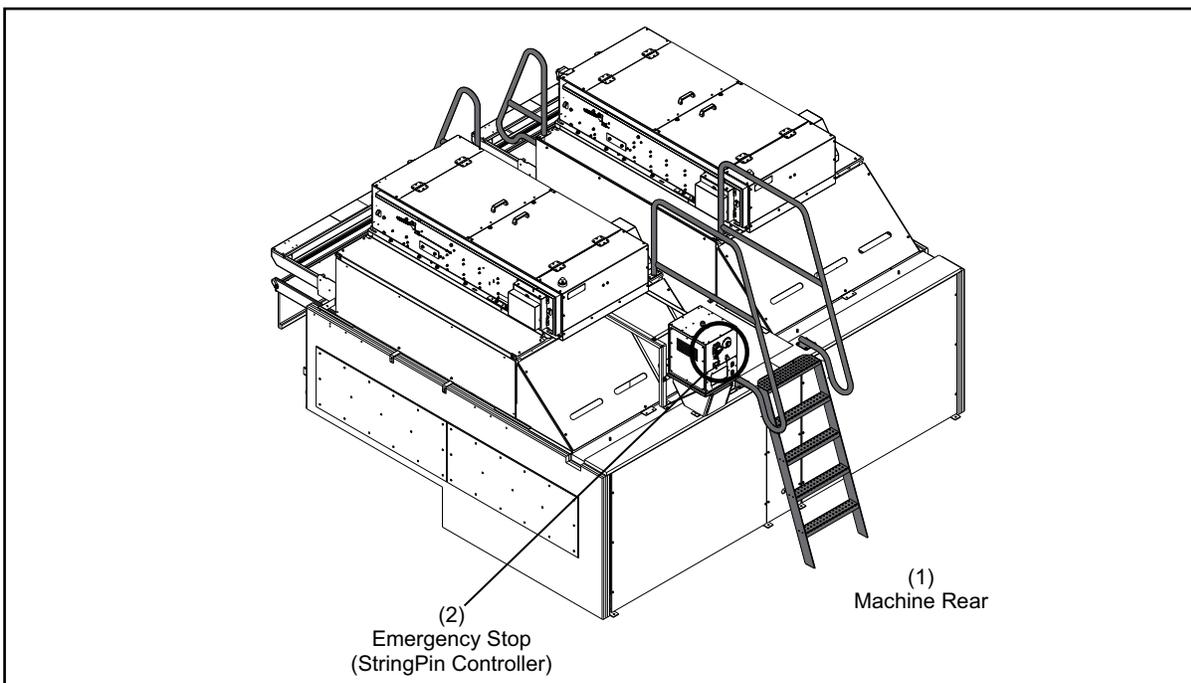
The Brunswick StringPin Pinsetter has two Emergency stop switches. These switches are to be used to stop the pinsetter immediately if an emergency were to arise. One E-Stop switch is located on the front of the machine and the other is located on the rear. Once an E-Stop has been activated, the high voltage power will be removed from both machines of the lane pair. Refer to the figures titled *E-Stop Switch - Front Location* and *E-Stop Switch - Rear (Rear Mount String Pin Controller) Location*.



E-Stop Switch - Front Location

(1) MACHINE FRONT

(2) EMERGENCY STOP



E-Stop Switch - Rear (Rear mount StringPin Controller) Location

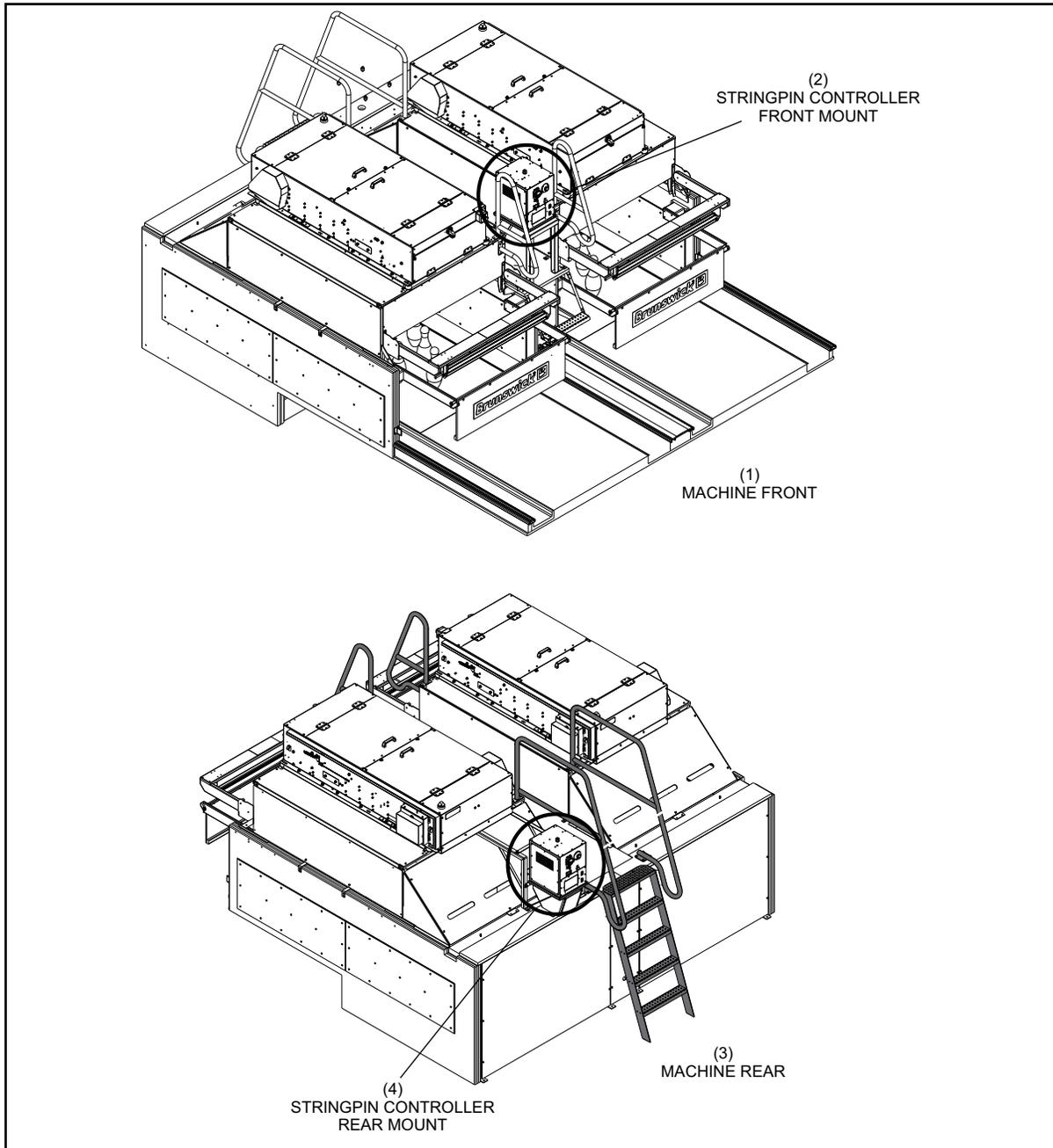
(1) MACHINE REAR

(2) EMERGENCY STOP (STRINGPIN CONTROLLER)

Section 3: StringPin Operation

STRINGPIN ELECTRONIC SYSTEM OVERVIEW

The electronic system for the string pinsetters consist of a single StringPin Controller mounted on the rear or front of the pinsetter. The Controller is responsible for the control and operation of the StringPin pinsetter. There is one StringPin Control box for each machine pair. Refer to the figure titled *String Pinsetter Controller Locations*.

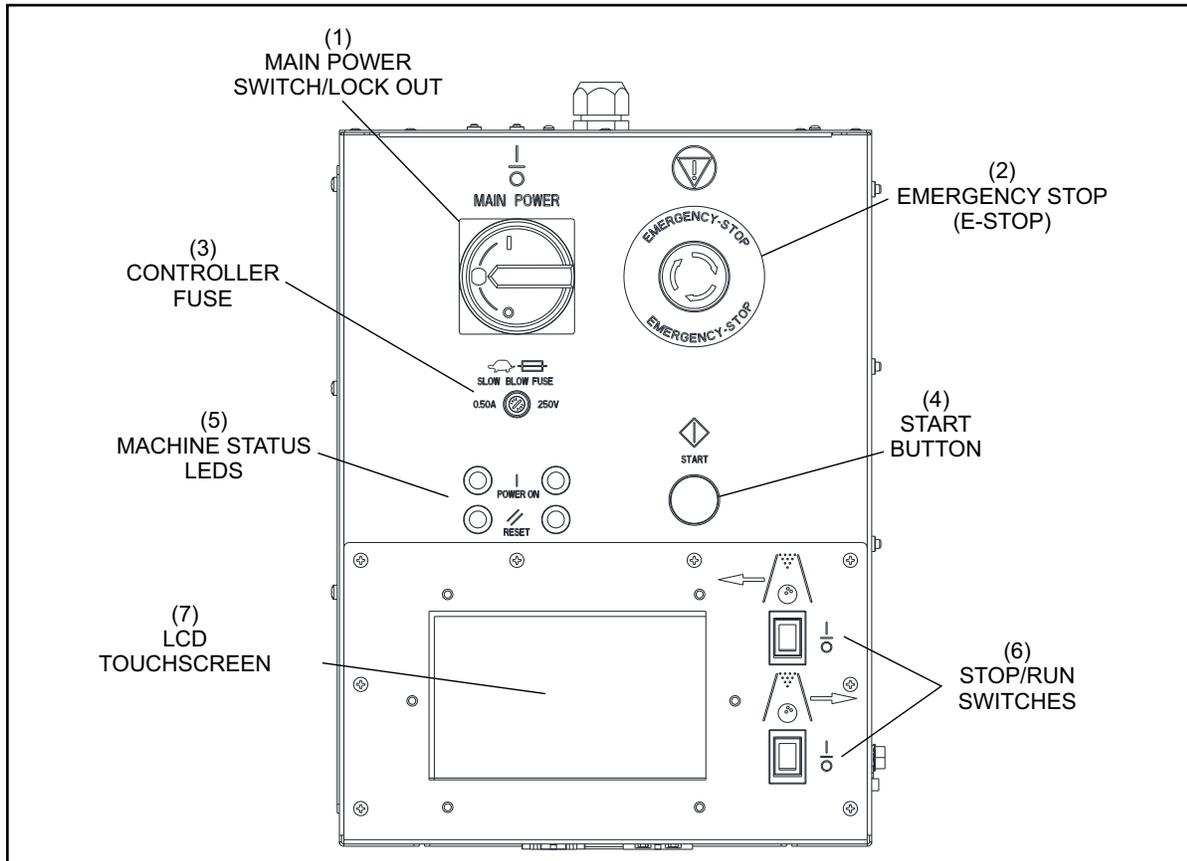


String Pinsetter Controller Locations

- (1) MACHINE FRONT
- (2) STRINGPIN CONTROLLER (FRONT MOUNT)
- (3) MACHINE REAR
- (4) STRINGPIN CONTROLLER (REAR MOUNT)

STRINGPIN CONTROLLER OVERVIEW

The StringPin pinsetter is controlled and operated by the StringPin Controller. The controller also allows the operator to start/stop the pinsetter, select different pinsetter modes, spot all/combinations of pins, view error codes, and more. Refer to figure titled *StringPin Controller Overview*.



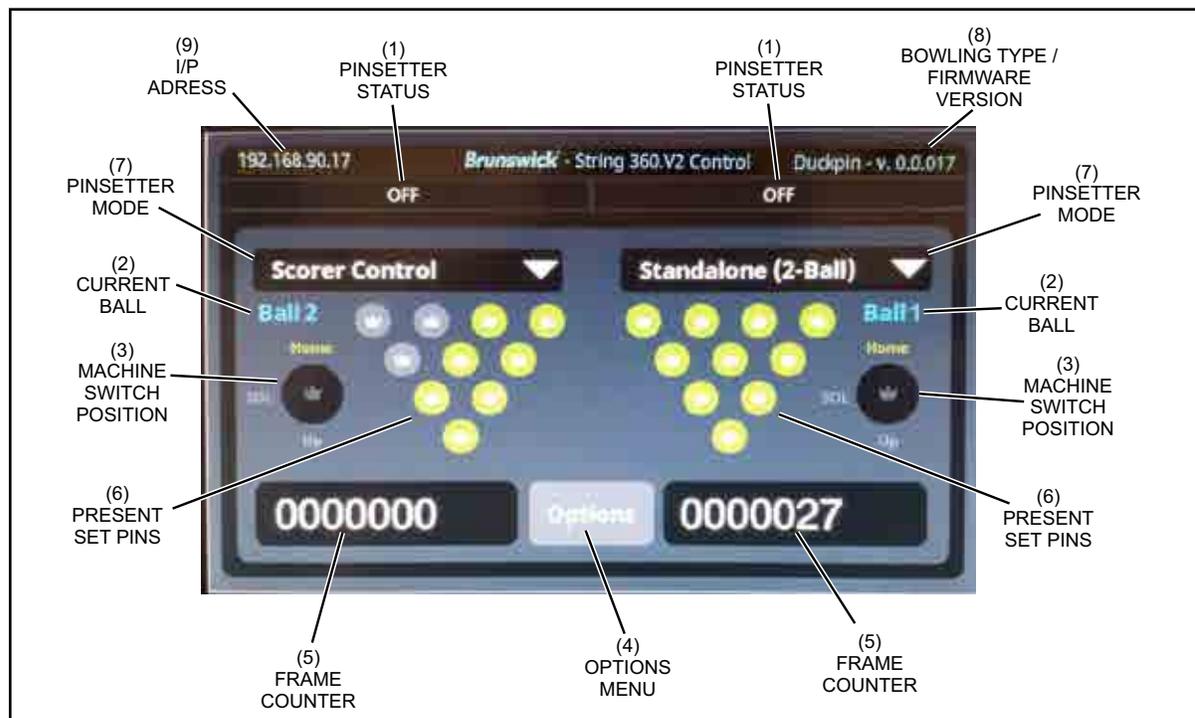
StringPin Controller Overview

- | | | |
|----------------------------|-------------------------|--|
| (1) MAIN POWER SWITCH/LOCK | (2) EMERGENCY STOP | (3) CONTROLLER FUSE |
| (4) START BUTTON | (5) MACHINE STATUS LEDS | (6) LEFT/RIGHT MACHINE STOP/RUN SWITCH |
| (7) LCD TOUCHSCREEN | | |

Touchscreen Overview

Touchscreen Main Screen

The Stringpin Controller has an interactive touchscreen display that allows the user to review the current status of a pinsetter, set pins, select different modes, view the frame count, view the switch cluster position, pinsetter ball status (depending on the set mode: ball 1, 2 or 3), and more. Refer to the figure titled *LCD Touchscreen - Overview (Main Screen)*.



LCD Touchscreen - Overview (Main Screen)

- (1) **Pinsetter Status** - Pinsetter power and error code status (if applicable). This area will display the OFF / RUN status or the error description if the pinsetter is in an error state. Refer to the pinsetter error code chart for more information.
- (2) **Current Ball** - Pinsetter ball count. This will display the current pinsetter ball count. Depending on the mode (2-Ball or 3-Ball), the pinsetter ball count could be one, two, or three. Each ball count refers to the traditional cycle sequence of the pinsetter:

Ball 1 - 10 Pins, first ball

Ball 2 - Spare Ball

Ball 3 - Cleanup (3-ball mode only)

- (3) **Machine Switch Position** - Display of current position of the switch cluster cam as it rotates and passes the three cluster switches.

Home - Indicates the “Home” switch is actuated. In this position, the wagon is at the front of the pinsetter and the pins are spotted on the pin deck

Up - Indicates the “Pins Up” switch is actuated. In this position, The wagon is at the back of the pinsetter and the pins are in the up position.

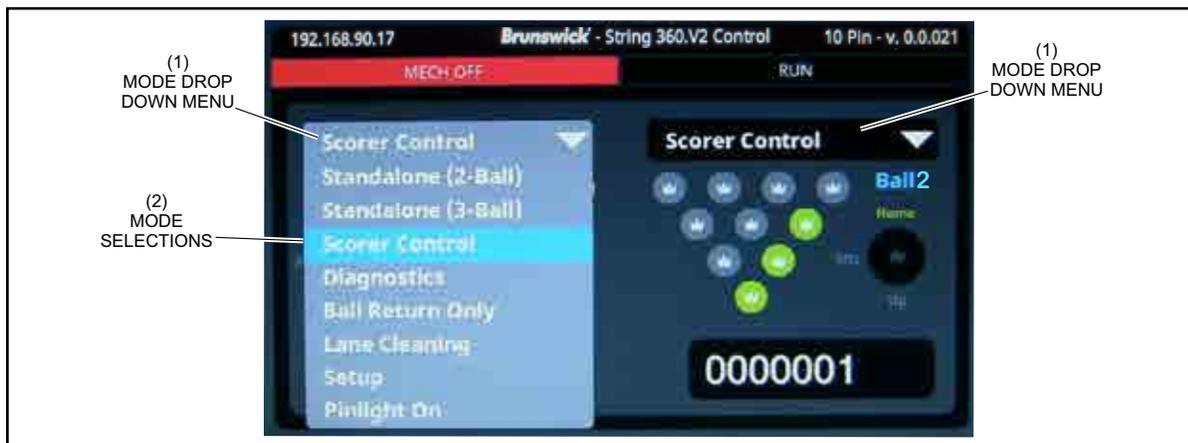
SOL- Indicates that the wagon is moving from the back to the front of the machine and has actuated the string solenoid switch. This switch determines when the string solenoids are energized.

- (4) **Options Menu** - The options menu allows the user to select language, detangle sequence, pinsetter off state, delay after ball detect, ball return off delay, and ball return energy time out. This menu is only available when both STOP/RUN switches on the Controller are in the STOP position.
- (5) **Frame Counter** - Frame counter display. This displays the total number of frames the pinsetter has run in each mode.
- (6) **Present Set Pins** - Graphical display of the pins that indicates the pins currently standing on the pindeck.
- (7) **Pinsetter Mode** - Pinsetter mode display and drop down menu mode selector. Use this menu to select the desired pinsetter mode. This drop down menu is only available when the STOP/RUN switch on the Controller for the pinsetter is in the STOP position.
- (8) **Bowling Type / Firmware Version** - Display of the bowling type currently selected in the Options configuration of the 360 Controller along with the installed software version number. The bowling type is selectable using Options screen 1. Selections include:
 - 10-Pin** - This option selects standard 10 scoring and de-tangle sequence programming optimized for 10-pin type pins.
 - Duckpin** - This option selects Duckpin scoring and de-tangle sequence programming optimized for duckpin type pins.
 - 5-Pin** - This option selects 5-pin scoring and de-tangle sequence programming optimized for pins used with 5-pin bowling.
- (9) **I/P Address** - Network address assigned to the 360 controller by the Sync Scoring Network.

Pinsetter Mode - Drop Down Menu

The StringPin Pinsetter is programmed with several operating modes. These modes allow the operator to run the machine in different states depending on the situation and/or the desired operation. The modes are selected by using the drop down menu on the LCD Touchscreen. Refer to the figure titled *LCD Touchscreen - Pinsetter Mode Drop Down Menu*.

i **NOTE:** The Pinsetter Mode Menu is only available when the Stop/Run switch for the pinsetter is in the STOP position.



LCD Touchscreen - Pinsetter Mode Drop Down Menu

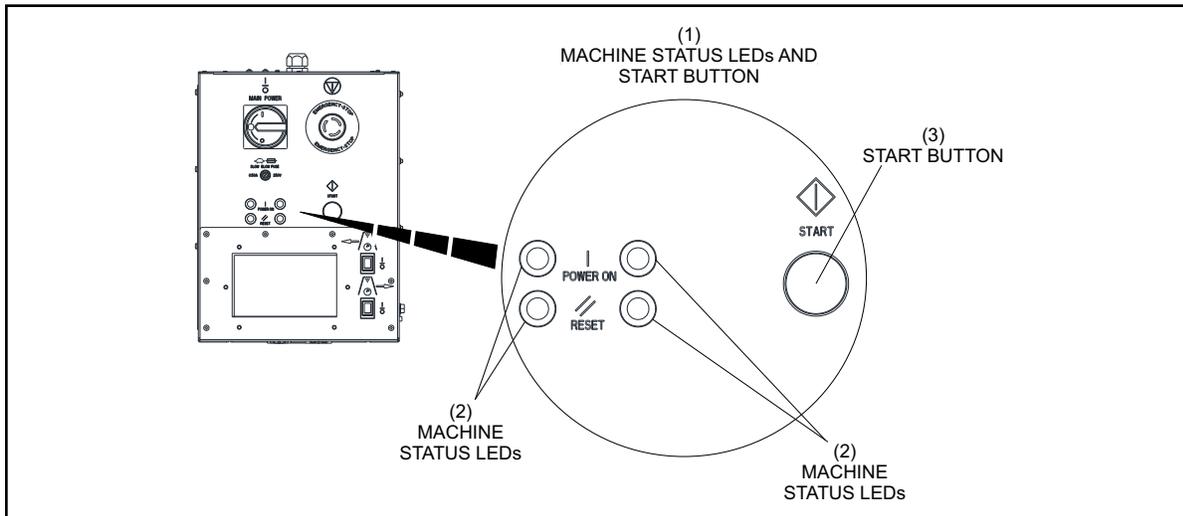
The items that appear on the Pinsetter Mode Drop Down Menu include:

- (1) **Mode Drop Down Menu** - Select the down arrow to expand the expand the pinsetter mode menu.
- (2) **Mode Selections** - The menu has the following selections:
 - **Standalone (2-Ball)** - The 2-Ball Stand alone mode runs independent of the scoring system. In this mode the pinsetter will operate in a 2 balls per frame mode but will not communicate with or provide scoring information to the scoring system (if installed).
 - **Standalone (3-Ball)** - 3-Ball Standalone mode, runs independent of the scoring system. In this mode the pinsetter will operate in a 3 balls per frame mode but will not communicate with or provide scoring information to the scoring system (if installed).
 - **Scorer Control** - Scoring dependent mode. In this mode the pinsetter will operate in a 2 balls per frame mode but and will communicate with and provide scoring information to the scoring system. While in this mode, the scoring system dictates all pinsetter operation.
 - **Diagnostics** - While in this mode the pinsetter will run a continuous cycle until the user exits the mode or a pinsetter error condition occurs. During operation, the pinsetter spots and retracts each individual pin in sequence.
 - **Ball Return Only** - Turns on the ball return for diagnosis.
 - **Lane Cleaning** - Raises and keeps the pins in the up position by engaging the PMI string brake so that the operator can run the lane machine to clean and condition the lane surface. When this option is selected, the pinsetter lifts all 10 pins to up position.
 - **Setup** - Mode used to set up and adjust the StringPin pinsetter. When this option is selected, the pinsetter lifts all 10 pins to the up position so that the string wagon can stop on the stop dogs. Normally this is used when performing the string tension adjustment.
 - **Pinlight On** - When selected, this option causes the pinlight to turn “ON”. Typically this feature is used to provide additional light for the mechanic when performing maintenance of the pinsetter.

Machine Status LEDs and Start Button

The StringPin Controller is equipped with four led lights, that can be used to indicate machine power and the Controller reset status. Specifically the LEDs monitor status of the 2 internal power contactors which supply power to the controller’s inner circuits. There is a set of LEDs for each contactor. The red “Power On” LED indicates that the related contactor is energized. The green “Reset” LED indicates that the contactor is de-energized and must be re-energized by using the **Start** pushbutton.

Because the power contactors are wired in series, the each set of LEDs indicate the same information, the status of the controller which in turn is the power status of both pinsetters. Refer to the figure titled *Power On Lights - Reset Lights - Start Button*.

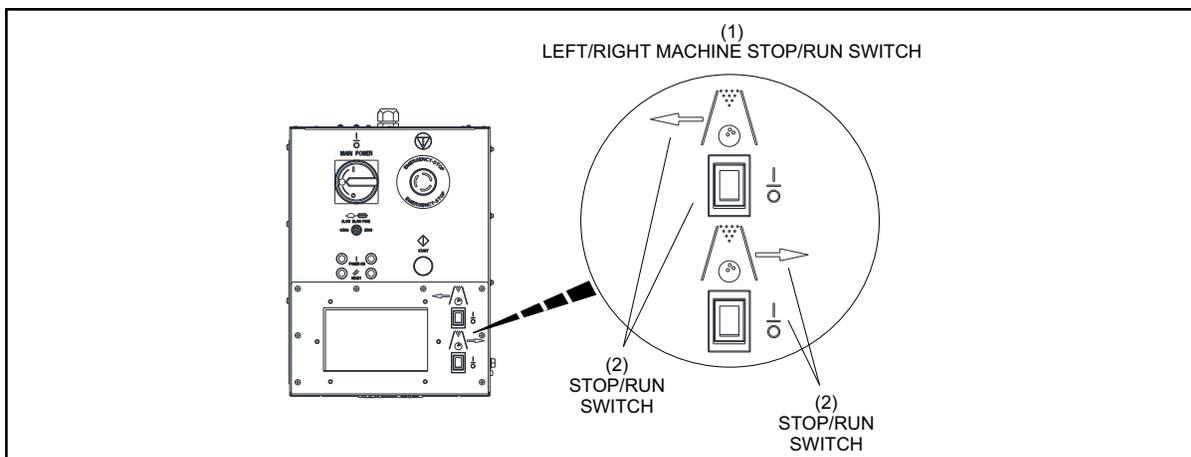


Power On Lights - Reset Lights - Start Button

- (1) MACHINE STATUS LEDS AND START BUTTON
- (2) MACHINE STATUS LEDS
- (3) START BUTTON

Stop/Run Switches

The StringPin Controller is equipped with two Stop/Run switches, one for each pinsetter. These switches are used to temporarily turn off the pinsetter so that the touchscreen can be used to change the mode, clear error codes, and perform other functions for a pinsetter. . **The arrow indicates which pinsetter the switch controls.** Refer to the figure titled *Left/Right Machine Stop/Run Switch*.



Left/Right Machine Stop/Run Switch

- (1) LEFT/RIGHT MACHINE STOP/RUN SWITCH
- (2) STOP/RUN SWITCH

START/RESTARTING THE PINSETTER

With Scoring Control

Follow this procedure to start/restart the pinsetter for scoring control. This mode requires the scoring system to be on and ready to score. If the scoring system is not on and assigned to the lane, the pinsetter will not turn on and cycle.

1. Make sure that the pinsetter is clear of any operating personal, tools, parts, and it is ready to start. Be sure to check all work areas and access points.
2. Follow the power on sequence:
 - A. On the StringPin controller, toggle the Pinsetter **Run/Stop Switches** to STOP
 - B. Reset all **E-Stop Switches** if they were pressed
 - C. Make sure that all other StringPin Run/Stop switches are toggled to the run position
 - D. Unlock the main power and turn main power switch to ON
3. On the StringPin Controller Main Screen, select **Scorer Control** using the drop down menu. Refer to the figure titled *Mode Set - Scorer Control*.



Mode Set - Scorer Control

- (1) SCORER CONTROL
4. Toggle the **Run/Stop Switch** on the StringPin controller to **RUN**. Press the **Start Button** to begin pinsetter operation.
5. Proceed to the scorer desk and assign the lane to start the machine and begin bowling. The StringPin pinsetter will not do anything until the lane has been assigned from the desk client. The trouble light will be solid white, indicating that the machine is ready to run from the desk.

Stand Alone Mode (No Scoring Control)

Follow this procedure to start/restart the pinsetter for standalone mode. This mode does not require the use of a scoring system and will cycle independently. Electronic scoring will not function in this mode.

1. Make sure that the pinsetter is clear of any personal, tools, and it is ready to start. Be sure to check all work areas and access points.
2. Follow the power on sequence:
 - A. On the StringPin controller, toggle the Pinsetter **Run/Stop Switches** to STOP
 - B. Reset all **E-Stop Switches** if they were pressed
 - C. Make sure that all other StringPin Run/Stop switches are toggled to the run position
 - D. Unlock the main power and turn main power switch to ON
3. On the StringPin Controller Main Screen, select the Standalone (2-Ball) or (3-Ball) using the drop down menu. Refer to the figure titled *Mode Set - Standalone (2-Ball or 3-Ball)*.



Mode Set - Standalone (2-Ball or 3-Ball)

- (1) SELECT STANDALONE - 2 BALL
OR STANDALONE - 3 BALL

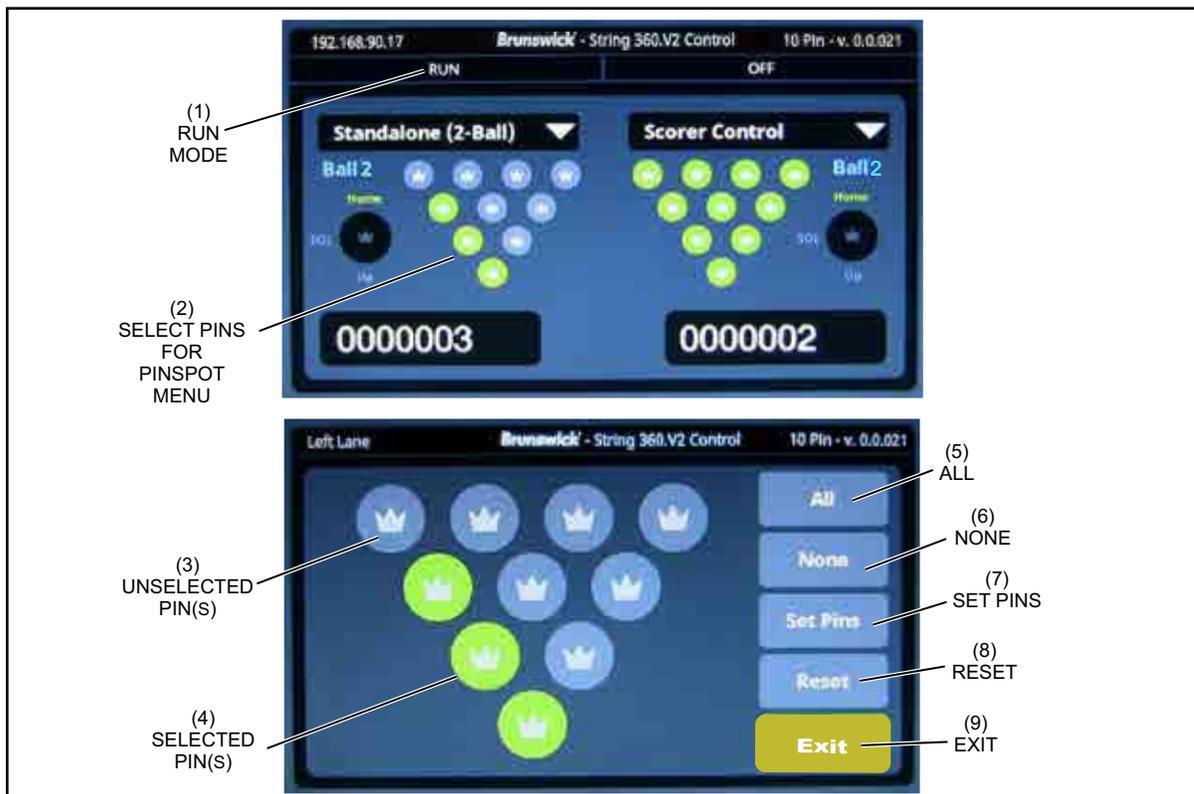
4. Toggle the Run/Stop Switch to RUN. Press the Start Button to begin pinsetter operation.
5. The StringPin pinsetter will engage standalone mode. The machine will run independently of the scorer and will not score on the down lane overhead(s). To engage a machine cycle, a ball or object will have to break the ball detect or knock over a pin. The machine will then cycle according to the selected mode.

SPOTTING PINS

Pinspot Menu

The StringPin Controller touchscreen has a dedicated menu for spotting pins. Use this menu to set any combination, all, or no pins and cycle the pinsetter. To navigate to the pinspot menu, select any of the **Red Pins** in the pin triangle on the main screen of the StringPin Controller touchscreen (main screen). Select the red pins of the appropriate machine: Left or Right. Refer to the figure titled *PinSpot Menu Navigation and Overview*.

i **NOTE:** The Pinsetter Mode Menu is only available when the Stop/Run switch for the pinsetter is in the RUN position and the pinsetter is turned ON.



PinSpot Menu - Navigation and Overview.

The function of the PinSpot Menu include:

- (1) **Run Mode** - The pinsetter must be in the “Run” mode to access the Pinspot Menu.
- (2) **Select Pins for Pinspot Menu** - Select the outlined pin triangle area to open the Pinspot menu for the desired lane.
- (3) **Selected Pin(s)** - A pin location that is highlighted in color indicates that the pin has been selected to be placed on the pindeck when the “Set Pins” button in pressed.
- (4) **Unselected Pin(s)** - A pin location that is NOT highlighted with in color indicates that the pin has been unselected and will not be placed on the pindeck when the “Set Pins” button in pressed.

- (5) **All** - This selection allows the user to quickly select all pins.
- (6) **None** - This selection allows the user to quickly unselect all pins.
- (7) **Set Pins** - This selection causes the pinsetter to place the selected pins on to the pindeck.
- (8) **Reset** - This selection allows the user to cycle (sequence) the pinsetter to the desired ball count.
- (9) **Exit** - Select to exit the Pinspot Menu.

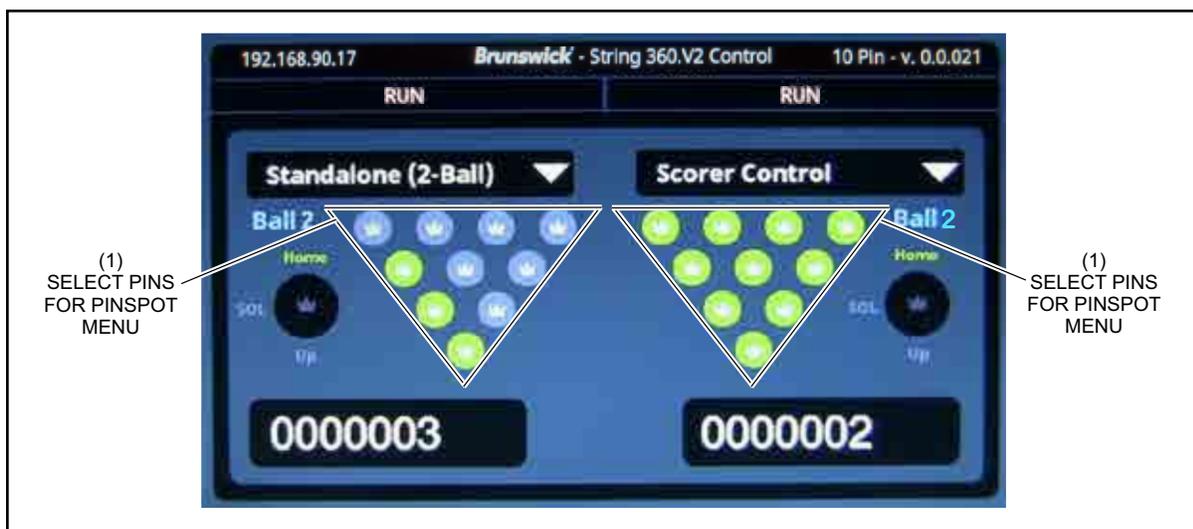
Reset all 10 Pins - Scoring Control or Stand Alone Mode

Follow this procedure to place all 10 pins onto the pindeck when the pinsetter is in Stand Alone or Scoring Control Mode. If it is necessary to spot individual or combinations of pins, see the next section Set Individual/Combinations of Pins (Stand Alone or Scoring Control Mode).

1. Check the status of the Pinsetter:
 - A. Check the StringPin Controller for error codes. If an error code has been reported or something is preventing the machine from running properly, see Section 4: Troubleshooting for further instruction.
 - B. Check the machine for conditions that might prevent the pinsetter from operating.
 - C. Once the pinsetter has been determined as clear, on, and operating proceed to the next step.

i ***NOTE:** Some errors or problems with the pinsetter may not be detected by the StringPin Controller. Examples are ball accelerator problems or scoring errors. In these situations, the status light will not flash to indicate a problem nor will an error code be reported.*

2. On the main screen of the StringPin Controller, select any of the **Red Pins** in the pin triangle to navigate to the pin spotting screen. Select the red pins of the appropriate machine: Left or Right. Refer to the figure titled *Select Pins for the PinSpotting Screen*.



Select Pins for the PinSpotting Screen

- (1) SELECT PINS FOR PINSPOT MENU

3. On the pin spotting screen, select **All** to select all 10 pins. All 10 pins will be filled in (red), meaning they are selected. Press **Set Pins** to start the pin spotting process. Refer to the figure titled *Select All Pins and Set Pins*.



Select All Pins and Set Pins

- (1) SELECT ALL PINS (2) SET PINS

Set Individual Pin Combinations - Scoring Control or Stand Alone Mode

Follow this procedure to set individual or combinations of pins when the pinsetter is in Stand Alone or Scoring Control Mode.

1. Check the status of the Pinsetter:
 - A. Check the StringPin Controller for error codes. If an error code has been reported or something is preventing the machine from running properly, see Section 4: Troubleshooting for further instruction.
 - B. Check the machine for conditions that might prevent the pinsetter from operating.
 - C. Once the pinsetter has been determined as clear, on, and operating proceed to the next step.

i **NOTE:** Some errors or problems with the pinsetter may not be detected by the StringPin Controller. Examples are ball accelerator problems or scoring errors. In these situations, the status light will not flash to indicate a problem nor will an error code be reported.

- On the main screen of the StringPin Controller, select any of the **Red Pins** to navigate to the pin spotting screen. Select the red pins of the appropriate machine: Left or Right. Refer to the figure titled *Select Pins for PinSpotting Screen*.



Select Pins for PinSpotting Screen

- SELECT PINS FOR PINSPOT MENU

- Select the individual or combinations of pins to be spotted by selecting each pin. The pin(s) selected for spotting will be shown as fully filled in circle(s). The pin(s) not selected will be empty circle(s). Press **Set Pins** to start the pin spotting process. Refer to figure titled *Select Pins and Set Pins*.

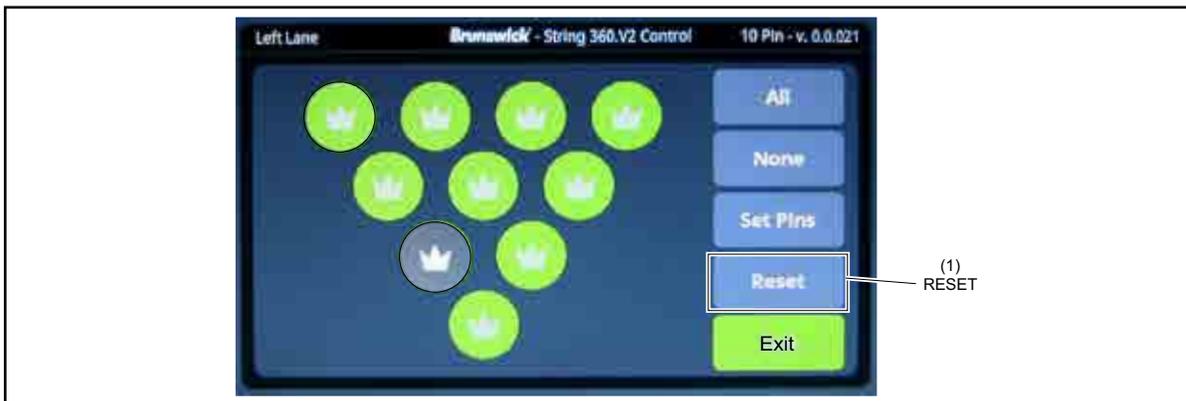
i **HINT:** Select **NONE** to deselect all the pins before selecting the specific pins needed to be spot.



Select Pins and Set Pins

- SELECTED PIN(S)
- UN SELECTED PIN
- SET PINS

4. After a pinspot, if the pinsetter needs to be on second or third ball (depending on the mode/ scoring mode selected) select **Reset** until the desired ball status has been set. Refer to the figure titled *Reset*.



Reset

(1) RESET

i **NOTE:** To return all pins to the **Pins Up** position, select the **None** button to Un-select all pins. Press **Set Pins** to start the pins spotting process. Refer to the figure titled *None*.



None

(1) NONE

(2) SET PINS

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Section 4: Troubleshooting

CLEARING ERROR CODES AND CORRECTING PINSETTER STOP

Although pinsetter stops that require a mechanic intervention occur infrequently, circumstances will occur that make them inevitable.

When a pinsetter does experience a stop, the StringPin Controller, will shut down the machine and flash the white Status Light located on top of the pinsetter. A code indicating the problem encountered will be shown on the display of the StringPin Controller.

i *NOTE: Some errors or problems with the pinsetter may not be detected by the StringPin Controller. Examples are ball accelerator problems or scoring errors. In these situations, the status light will not flash to indicate a problem.*

The following procedure should be used for correcting pinsetter stops or malfunctions.

1. When approaching the pinsetter, toggle the nearest STOP/RUN switch to the stop position.
2. Determine the reason for the stop. If the Status Light is flashing, look at the StringPin Controller Display for an associated error code.
3. Perform the appropriate procedure according to the issue/error code.
4. Once the issue has been fixed, make sure all of the following conditions are met before tuning the machine on:
 - Make sure that all unused parts, tools, and other mechanics are clear of the machine.
 - Replace all guarding if it was removed.
 - Make sure that all guarding is in its proper fixed place.
5. Toggle the STOP/RUN switches for each machine to the RUN position to clear the error code. Press the Start Button to start the pinsetter.
6. If the machine does not restart, recheck the error code diagnostic display and start the procedure over from step #1.

BALL RETURN STOP (BALL ACCELERATOR/PIT AREA/PIN DECK)

Suggested Work Location: Work Area 1, 2 & 3

Ball Return Stop/Ball Accelerator Overload occurs when the machine fails to return the bowling ball to the bowler. The bowling ball may be in one of several places. Identify the location of the bowling ball and take the appropriate action as referenced below. Refer to Ball Return Stop (Pit/Ball Accelerator).



CAUTION: *When accessing work areas 2 and 3, the main power switch on the StringPin controller must be locked in the off position using a suitable locking mechanism.*



CAUTION: *Detangling pins and/or addressing a Ball Return Stop places the mechanic between the bowler and the machine. Place and properly secure a Brunswick Ball Stop or similar 3rd Party Product between the bowler and the mechanic. Additionally, make sure that a bowler is not positioned to throw a ball before putting yourself between the bowler and the machine. It is a good practice to have another employee positioned near any bowler to ensure they cannot throw a ball and/or place a sign on the approach to indicate the lane is not available for bowling.*

1. Turn the **Stop/Run switch** on the StringPin Controller to the **STOP** position. Turn **OFF** the **Main Power Switch/Lockout** on the controller and lock the switch into the **OFF** position using an approved lockout device.
2. **Verify that all bowlers on the lane pair are off the approach and are not in a position to throw a ball.**
3. Identify where the bowling ball is stuck. The bowling ball might be in the pit area (behind the pin deck), ball accelerator, or the pin deck. Follow the appropriate procedure to address a ball call.

Ball Stopped in Ball Accelerator



NOTE: *If the ball is stopped in the ball accelerator, a broom or long thin tube like object will be needed to push the ball forward into the ball accelerator.*

- 4a. Enter Work Area 1 and insert the object into the Ball Accelerator Access Hole that is located behind the ladder. It might be necessary to remove the ladder temporarily for this procedure. Make sure to replace the ladder if it was removed when finished.
- 4b. Push the ball forward into the ball accelerator with the broom or long thin tube like object. Once finished, proceed to step #5.

Ball Stopped in Pit Area

i *NOTE: If the ball is stopped in the pit area, a broom or long thin tube like object will be needed to push/dislodge the ball so that it can roll into the ball accelerator.*

- 4a. Enter the pinsetter appropriately from the rear, walk into Work Area 2 and find the rear access ports for the pit area.
- 4b. Locate and free the bowling ball from the pit area by using the access ports located on the top rear of the pinsetter. Direct the ball roll into the ball door, then into the accelerator with its own weight.
- 4c. Once the ball is free, remove the broom or long thin tube like object and exit from Work Area 2. Once finished, proceed to step #5.

Ball Stopped on the Pin Deck

- 4a. Enter the pinsetter appropriately from the rear, walk through Work Area 2 to the front of the pinsetter. Place and properly secure a Brunswick Ball Stop or similar 3rd Party Product between the bowler and the mechanic. Enter Work Area 3.
- 4b. Locate and free the bowling ball from the pit area. Let the ball roll into the pit area, then to ball door, then into the accelerator with its own weight.
- 4c. Once the ball is free, exit from Work Area 3 - Pin Deck and remove the Brunswick Ball Stop. Enter Work Area 2 from the front and exit the machine from the rear of the machine. Once finished, proceed to step #5.
5. Once the Ball Return Stop has been addressed, make sure that all unused parts, tools, and other mechanics are clear of the machine. Check all work areas, access points, and surrounding areas.
6. Make sure that all guarding is in its proper fixed place. Replace all guarding if it was removed.
7. Once the machine has been cleared, unlock **Main Power Switch/Lockout** and turn it to the **ON** position. Toggle the **STOP/RUN switches** for each machine to the **RUN** position to clear the error code. Press the **Start Button** to start the pinsetter.

DETANGLING ERROR (CODE: TANGLE)

Suggested Work Location: Work Area 1 or 3

Although it occurs infrequently, a common error code experienced is a Tangle. This occurs when two or more pins have been intertwined in such a way that it requires a manual untangling. The StringPin pinsetter will attempt several times to separate the pins and if it fails to separate the pins, the machine will stop. The operator/mechanic will need to manually untangle the pins and reset the pinsetter. In most cases the tangle can be resolved from work area 1 by opening the pinsetter's back cover and using a pin hook untangle the strings. In some cases it may be necessary to untangle the strings by hand from work area 3.



CAUTION: *When accessing work areas 1 or 3, the main power switch on the StringPin controller must be locked in the off position using a suitable locking mechanism.*



CAUTION: *Untangling pins from work area 3 and/or addressing a Ball Return Stop places the mechanic between the bowler and the machine. Place and properly secure a Brunswick Ball Stop or similar 3rd Party Product between the bowler and the mechanic. Additionally, make sure that a bowler is not positioned to throw a ball before putting yourself between the bowler and the machine. It is a good practice to have another employee positioned near any bowler to ensure they cannot throw a ball and/or place a sign on the approach to indicate the lane is not available for bowling.*

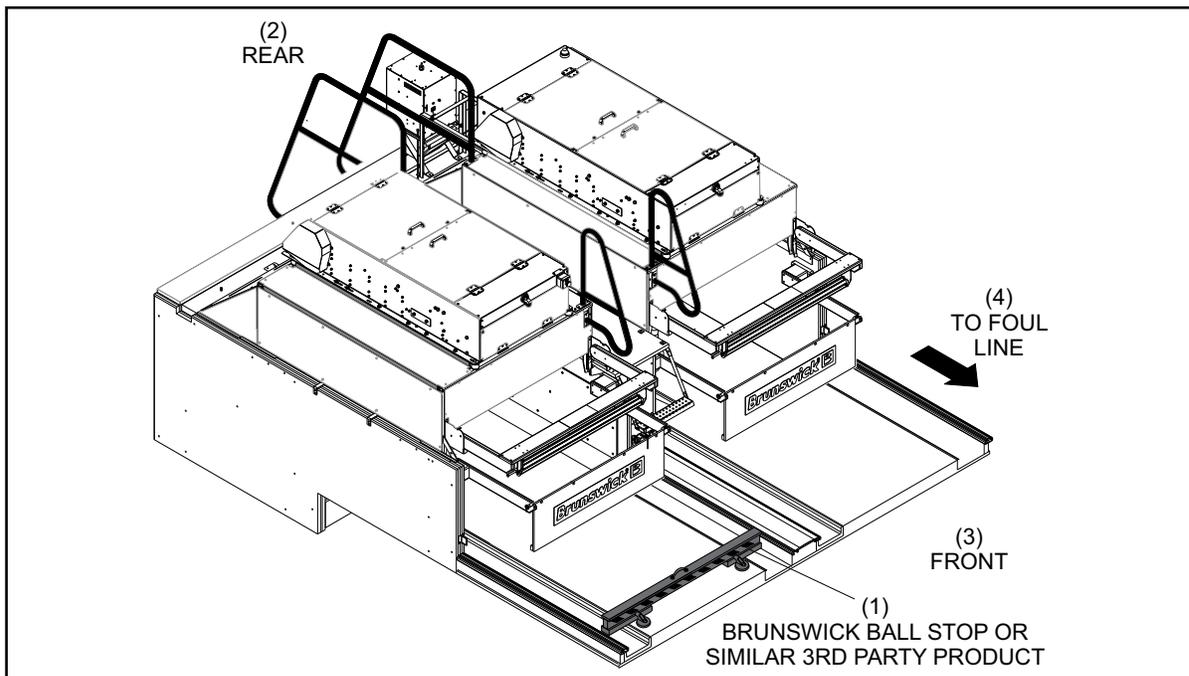
Untangling Pins From Work Location 1

1. Place the **Stop/Run switch** on the StringPin Controller to the **STOP** position. Turn off the **Main Power Switch/Lockout** on the controller and lock the switch into the **OFF** position using an approved lockout device.
2. **Verify that all bowlers on the lane pair are off the approach and are not in a position to throw a ball.**
3. Open the pinsetter rear access cover .
4. Use a pin hook detangling tool to untangle the pin strings.
5. Close the rear access cover.
6. Place the **Stop/Run switch** on the StringPin Controller to the **Run** position.

Untangling Pins From Work Location 3

In the event that untangling the pins using work location 1 is not possible, use work location 3 to gain access to the pin strings.

1. Turn the **Stop/Run switch** on the StringPin Controller to the **STOP** position. Turn off the **Main Power Switch/Lockout** on the controller and lock the switch into the **OFF** position using an approved lockout device.
2. **Verify that all bowlers on the lane pair are off the approach and are not in a position to throw a ball.**
3. Enter the pinsetter appropriately from the rear, walk through Work Area 2 to the front of the pinsetter. Place and properly secure a Brunswick Ball Stop or similar 3rd party product between the bowler and the mechanic. Enter Work Area 3- pin deck.



Brunswick Ball Stop/3rd Party Product

- (1) BRUNSWICK BALL STOP OR 3RD PARTY PRODUCT (2) REAR (3) FRONT
(4) TO FOUL LINE

4. Untangle the pins.
5. Exit from Work Area 3 - pin deck and remove the ball stop. Exit the rear of the machine through Work Area 2.
6. Make sure that all unused parts, tools, and other mechanics are clear of the machine. Check all work areas, access points, and surrounding areas.
7. Make sure that all guarding is in its proper fixed place and all access covers are closed.
8. Unlock Main Power Switch/LockOut and turn it to the ON position. Toggle the STOP/RUN switches for each machine to the RUN position to clear any error codes. Press the Start Button to start the pinsetter.
9. If the machine did not restart, recheck the error code diagnostic display on the StringPin Controller and take the appropriate action.

MACHINE RUN FAILURE (POSSIBLE CODE: HOME SWITCH EXPECTED)

Suggested Work Location: Work Area 1

A common user error is to forget to start the pinsetter after a power disruption. The machine will not run unless turned on and started by pressing the start button on the StringPin Controller. If the machines are on but not running or if the touchscreen display on the StringPin Controller is reporting a **Home Switch Expected** or other switch expected error code, refer to Machine Run Failure (Code: Home Switch Expected) to clear the code and start the machine.

i *NOTE: If the error code persists after following this procedure, refer to the StringPin service manual and consult authorized personal to provide proper machine maintenance.*

1. Turn the **Stop/Run switch** on the StringPin Controller to the **STOP** position.
2. Locate and observe the Reset and Power On LEDs on the StringPin Controller. If the green Reset LEDs are illuminated, the machine is ready to be started. Locate and press the **Start Button**. The Reset LEDs will turn off and the red Power ON LEDs will illuminate.
3. Make sure that all unused parts, tools, and other mechanics are clear of the machine. Check all work areas, access points, and surrounding areas.
4. Make sure that all guarding is in its proper fixed place. Replace all guarding if it was removed.
5. Once the machine has been cleared, toggle the STOP/RUN switches for the machine to the RUN position to clear the error code.
6. If the machine did not restart, recheck the error code diagnostic display on the StringPin Controller and take the appropriate action.

REMOVING BALL MARKS FROM LANE SURFACE

Most ball and other marks on the lane surface can be removed using clean, damp, nonabrasive cotton cloth and a mild liquid detergent or household cleaner.

For stubborn marks a clean, nonabrasive cotton cloth along with Brunswick Approach Spot Cleaner, part number 62-860034-004, or isopropyl alcohol can be used.

For extreme situations the light abrasive pad such as Magic Erasers may be used directly on the mark.

i *IMPORTANT: Excessive use of abrasive pads or other material to clean the lane surface can dull or scratch the lane surface. Use these cleaning methods only as needed.*