

Brunswick Electronic Five Pin Indexing Kit 12-862028-000

The purpose of this kit is to replace five pin indexing components that wear and can cause pinsetter stops with a positive index electronic system that eliminates wear and reduces pinsetter stops in this critical area of the “A”, “Jet Back” or “A-2” pinsetter.

Packaging

1 ea. 12-862028-000 Electronic Five Pin Indexing Kit

- 1 ea. 12-150340-000 Mounting Bracket Assembly
 - 1 ea. 10-229455-000 O-Ring Pin
 - 2 ea. 12-150321-000 Spacer
 - 2 ea. 11-010820-015 Screw #6 - 32 x 1/4” Type T
 - 2 ea. 11-101208-000 Set Screw 5/16 - 18 x 3/4”
 - 2 ea. 11-125102-015 Hex Nut - 5/16 - 18
 - 2 ea. 11-005090-015 Screw - #10 - 24 x 5/8” Socket
 - 2 ea. 11-190006-015 Plain Washer #10
 - 2 ea. 11-176006-015 #10-24 Locknut - KEPS
 - 1 ea. 11-625538-000 O-Ring
 - 1 ea. 11-602101-000 Connector - Cable
 - 1 ea. 12-150400-000 Mounting Bracket - Solenoid
 - 1 ea. 12-150344-000 Cover
 - 1 ea. 12-150345-000 Base
 - 1 ea. 12-150336-000 Solenoid 120V (Altered)
 - 1 ea. 12-150320-000 Link
 - 1 ea. 12-752023-000 Solenoid Cable (82”)

- 1 ea. 12-862031-000 Hardware Pack
 - 1 ea. 11-190006-015 Washer - #10
 - 1 ea. 8-191 O-Ring Pin
 - 1 ea. 11-625538-000 O-Ring
 - 1 ea. 12-150339-000 Magnet
 - 12 ea. 11-603141-000 Cable Ties 0.18 x 11”
 - 1 ea. 11-603201-000 Hose Clamp
 - 4 ea. 11-082231-015 Screw - #6 x 3/8” Type AB
 - 1 ea. 12-862031-700 Pack List

- 1 ea. 12-150338-000 Reed switch & Mounting Bracket Assembly

- 1 ea. 12-752021-000 Reed Switch to PCB (74”)

- 1 ea. 12-752022-000 PCB Power Supply Cable (28”)

- 1 ea. 12-150343-000 Circuit Board & Enclosure

- 1 ea. 12-900054-000 Installation Instructions

- 1 ea. 12-862028-700 Pack List

Tools Required

- Open End Wrench (1/2")
- Open End Wrench (3/16")
- Allen Wrenches
- Needle Nose Pliers,
- Flat Blade Screwdriver,
- Phillips Screwdriver (small)
- 3/8" Drill Motor
- Drill Bit (1/8")

Installation

Solenoid Mounting Plate 12-150340-000 Installation

(Please read entire installation instructions before proceeding. Allow 40 minutes for installation)

Be sure the turret is indexing correctly, review #41 in the adjustments section of the service manual "Turret Index Trip Lever Adjustment", and replace any worn indexing parts such as the 12-150235-000 latch assembly and 12-150289-000 short turret link.

1. Make sure there are no pins in the turret, then cycle the pinsetter to 270 degrees Setting New Pins position.



WARNING! DISCONNECT THE MAIN POWER CORD TO THE PINSETTER.

2. Location of solenoid mounting plate assembly 12-150340-000: (Refer to *Figures 1 & 2*). Remove the 12-150187-000 turret pan from the turret frame.

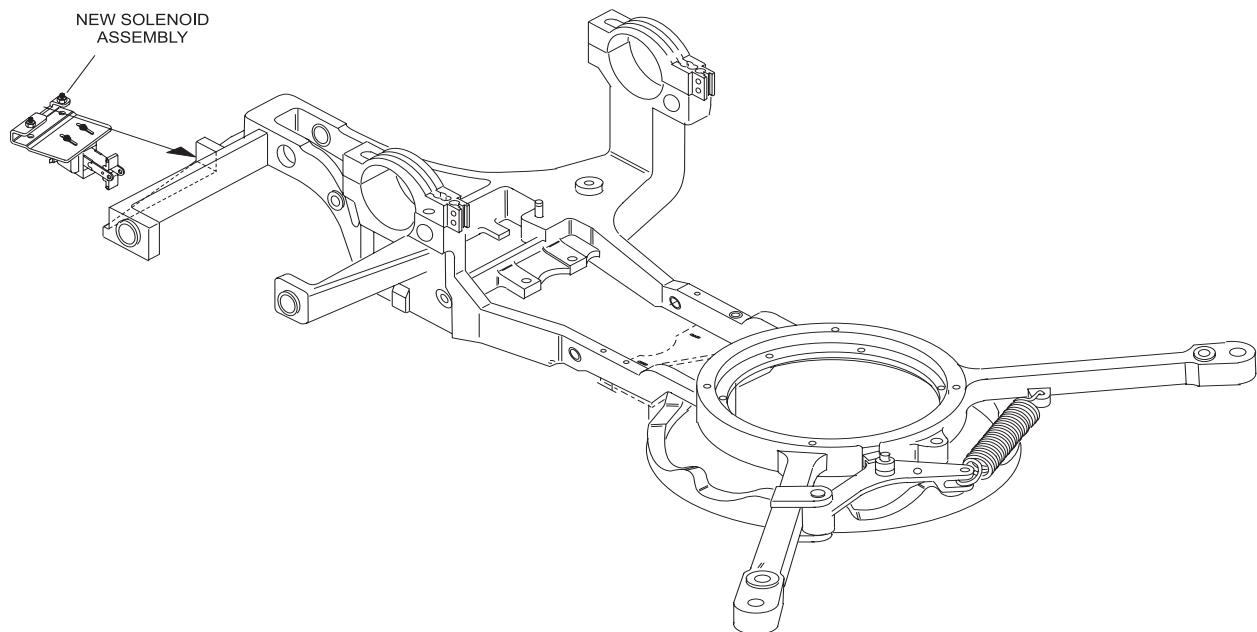


Figure 1

3. Remove the rear x-washer pin from the turret-indexing link (connected to the turret indexing bell crank). Refer to *Figure 1*.



IMPORTANT: *THE ALIGNMENT OF THE SOLENOID AND LINK TO THE EXISTING INDEXING LINKAGE IS CRITICAL FOR MAXIMUM PERFORMANCE.*

4. Install the mounting plate with the solenoid fastened to it from under the turret. Lift the mounting plate, with the clamp end toward the rear of the turret frame, until the plate can be lifted enough beyond the turret frame to allow the clamp end to hook over the rear of the turret frame. Then pull the mounting plate forward. At that point the mounting plate is hanging loose from the turret frame. Move to the top of the pinsetter and reach down to position the solenoid and mounting plate and tighten the set screws and jam nuts. Make sure the bracket is level with the turret frame. *Figure 2 shows location of the solenoid mounting plate after installation.*

Solenoid Link and Plunger Assembly Installation

1. Install the new solenoid plunger and link assembly into the new solenoid. The end loops of the link should be facing up to provide clearance from the frame. The new link attaches to the turret indexing bell crank. Use the new longer O-Ring pin with the new link on the outside (7 pin side) of the turret indexing bell crank and put the indexing link back in its normal position. Some turret frames may require dropping the turret indexing bell crank down to get clearance to install the longer pin. Secure the O-Ring pin with the #10 washer and O-Ring provided. Check to make sure that the new link does not bind against the turret frame or the turret pan. If there are clearance issues, the new link may be bent slightly. Refer to *Figure 2*.

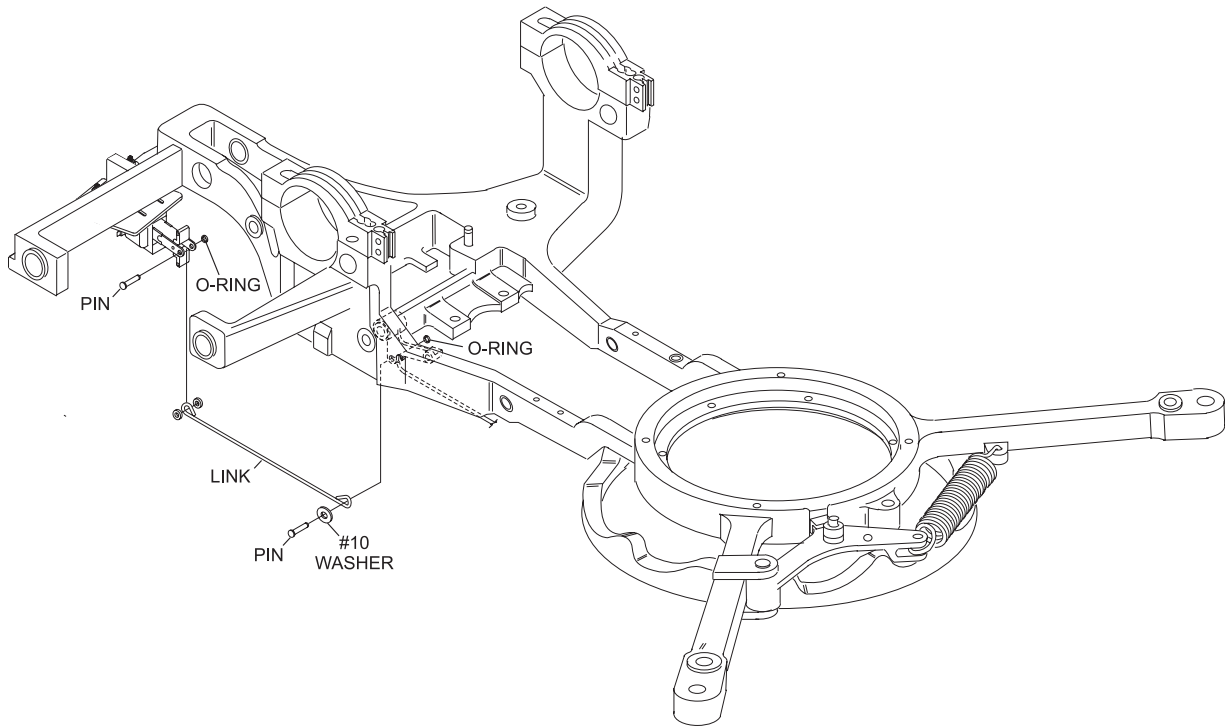


Figure 2

Adjusting The Solenoid

Although the solenoid is factory preset there may be a need for adjustment.

1. Although the solenoid is factory preset there may be a need for adjustment.
Adjustment: Manually actuate the indexing trip lever and manually rotate the turret until the indexing roller is on the high dwell of the indexing cam. At this point the solenoid plunger should be properly seated and the indexing linkage moves without binding. There are two sets of holes ¼" forward and rearward that may be used to reposition the solenoid assembly. While holding the new solenoid plunger fully engaged (completely compressed), the new link should pull the indexing stop latch forward allowing the turret to index one position. It is important that the stop latch is not pulled too far forward as it could cause binding on the turret indexing cam.

i **IMPORTANT:** The alignment of the solenoid and link to the existing indexing linkage is critical for maximum performance. If any adjustment is needed the solenoid can be moved slightly foreword or backward on the mounting plate.

Reed Switch Block Installation

The location of the Reed switch block is at the front 7-pin side of the turret frame. (where the turret frame support rod is bolted).

1. With the Reed switch block angled edge facing the rear of the pinsetter, the cut out of the block slides over the turret frame and should be positioned against the frame mounting the turret release lever. Secure the Reed switch block with a cable tie. Fasten the clamp around turret frame arm and against the Reed switch block to prevent it from “walking”. Route the Reed switch wires along the top of the turret frame and secure with a cable tie. Some slack should be left in the cable to allow for turret movement during a jam. Refer to *Figure 3*.

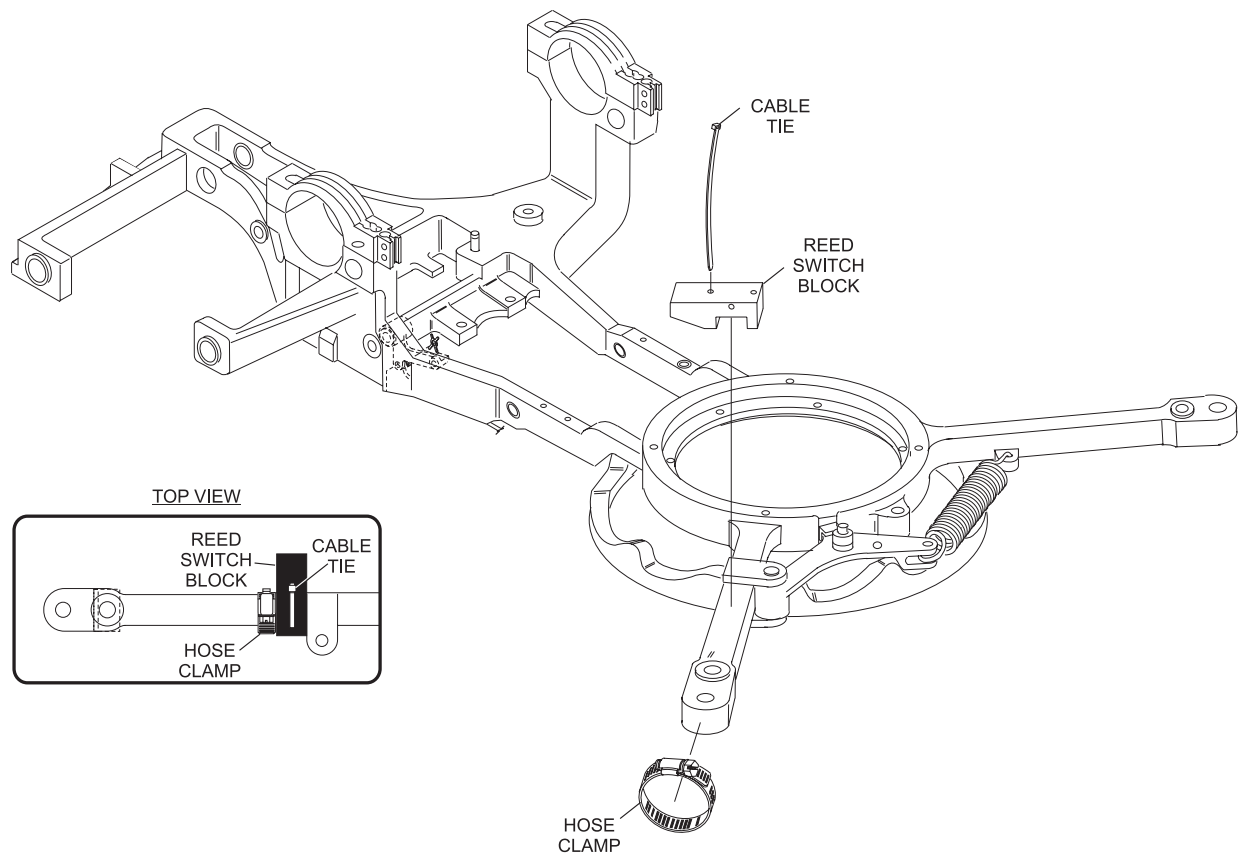


Figure 3

Magnet installation

1. Manually rotate the turret to the 5-pin position.
2. Locate the #4-PIN spoon and attach the magnet as shown in *Figure 4*.

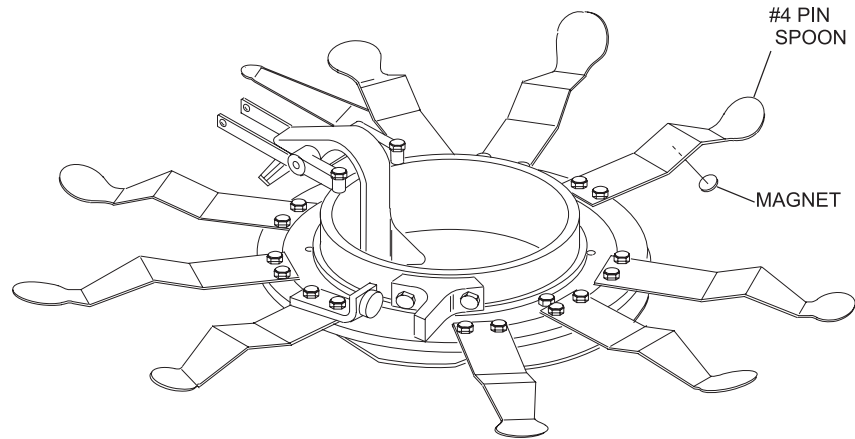


Figure 4

Wiring instructions for Electronic 5 - Pin Indexing

1. With the power still disconnected from the pinsetter, remove electrical box cover from pinsetter.
2. Remove the enclosure's cover.
3. A possible location for the 5-pin indexing circuit board enclosure is on top of the electrical box (Figure 5). Using the 4 holes in the enclosure's flange as a guide, find a location where the #6 X 3/8" screws provided will not interfere with the components in the electrical box. Carefully drill four 1/8" holes and secure the enclosure. Refer to *Figure 5*.

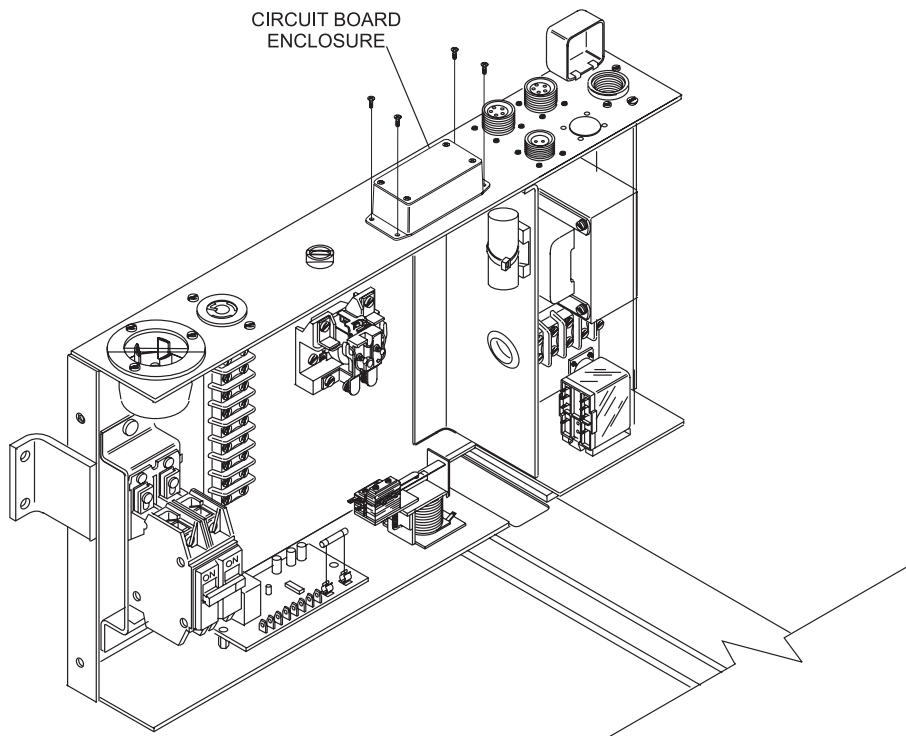


Figure 5

Identifying Cables

Cable 1 - The solenoid cable 12-752023-000 attached to the solenoid bracket assembly (4 pin connector with 2 heavy black cables with 2 fork terminals on one end and 2 spade terminals on the other). Refer to *Figure 6*.

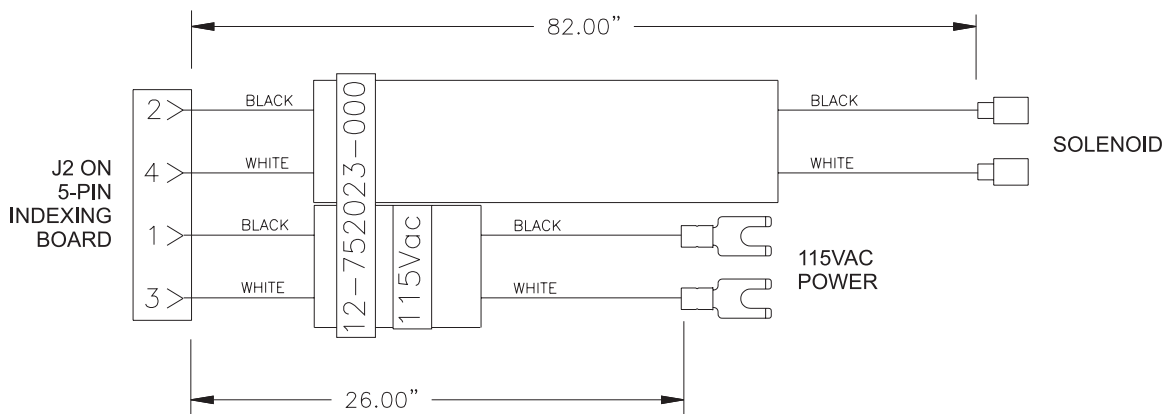


Figure 6

1. Route the long heavy cable with the spade terminals through the grommet in the wire channel continuing inside the channel to the circuit board enclosure.
2. Connect the 4 pin connector into the circuit board.
3. Secure using cable ties.
4. Route the 26" leg of this cable with fork terminals to terminal strips (TS1).
5. Attach the fork terminal connected to the black wire to terminal 3 on contactor RL3.
6. Attach the fork terminal connected to the white wire to terminal B on TS 1. Refer to *Figure 7*.

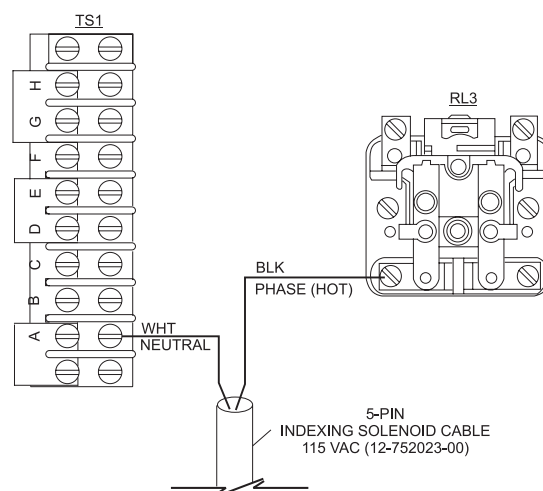


Figure 7



NOTE The power to the solenoid must be 110 to 120VAC. The best way to connect the 115Vac power cord to the 115Vac voltage is to follow where the Selenium Rectifier (SR), or Magnetic Clutch Power Supply, input wires 40 and 49 are connected. For Universal A2 electrical enclosures the wire number 49 is connected to the terminal B on high voltage terminal strip (TS1). Add the white solenoid wire, neutral, to this terminal. The wire number 40 is connected to the motor contactor (RL3), terminal 3. Add the black solenoid wire, hot, to this terminal. Refer to the Pinsetter Wiring Diagram to match your pinsetters. On Figure 6 illustrates the connection for Universal A2 electrical enclosure.

Cable 2 - The power input cable 12-752022-000 (28" gray cable with 2 fork terminals and a 2 pin receptacle. Refer to Figure 8

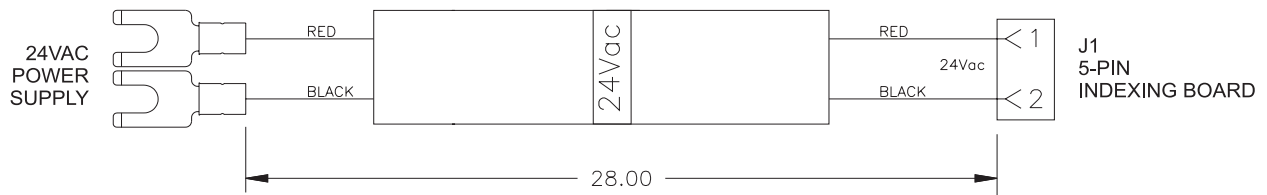


Figure 8

1. Connect the black wire from PCB "24Vac In", connector J1 to screw terminal #6 and the red wire to the screw terminal #9. The low voltage screw terminal strip (TS2) is located underneath the transformer. Refer to Figure 9.

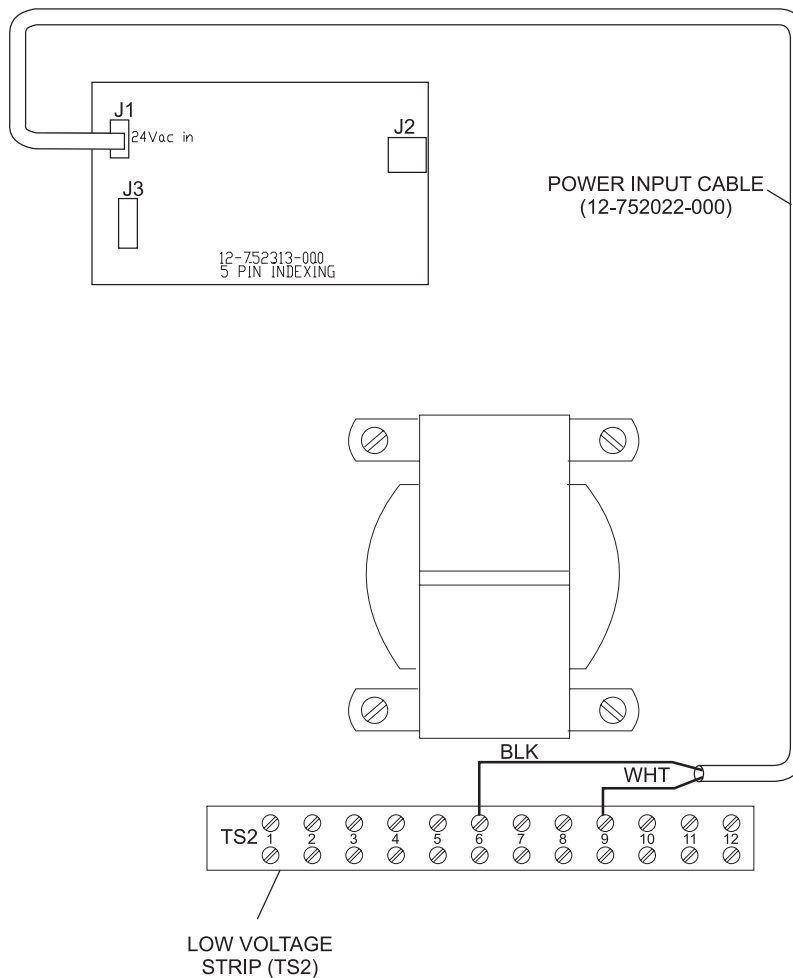


Figure 9

i **NOTE:** The power input voltage to the 5-pin indexing board must be 22 to 26Vac.

Cable 3 - The Reed switch input cable 12-752021-000 (3 wire 74" gray cable with 3 pin receptacle). Refer to Figure 10.

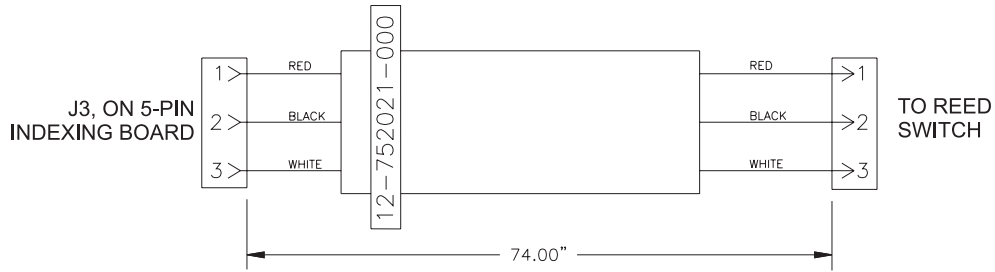


Figure 10

1. Route the cable from the PCB enclosure to the Reed switch block on the turret frame securing it using the cable ties provided.
2. Route the cable on the outside of the support rod to avoid any interference with the pin wires.
3. Connect the male 3 pin connector with locking tab into the female 3 pin connector on the Reed switch block. Some slack should be left in the cable to allow for turret movement during a jam. Refer to Figure 11.

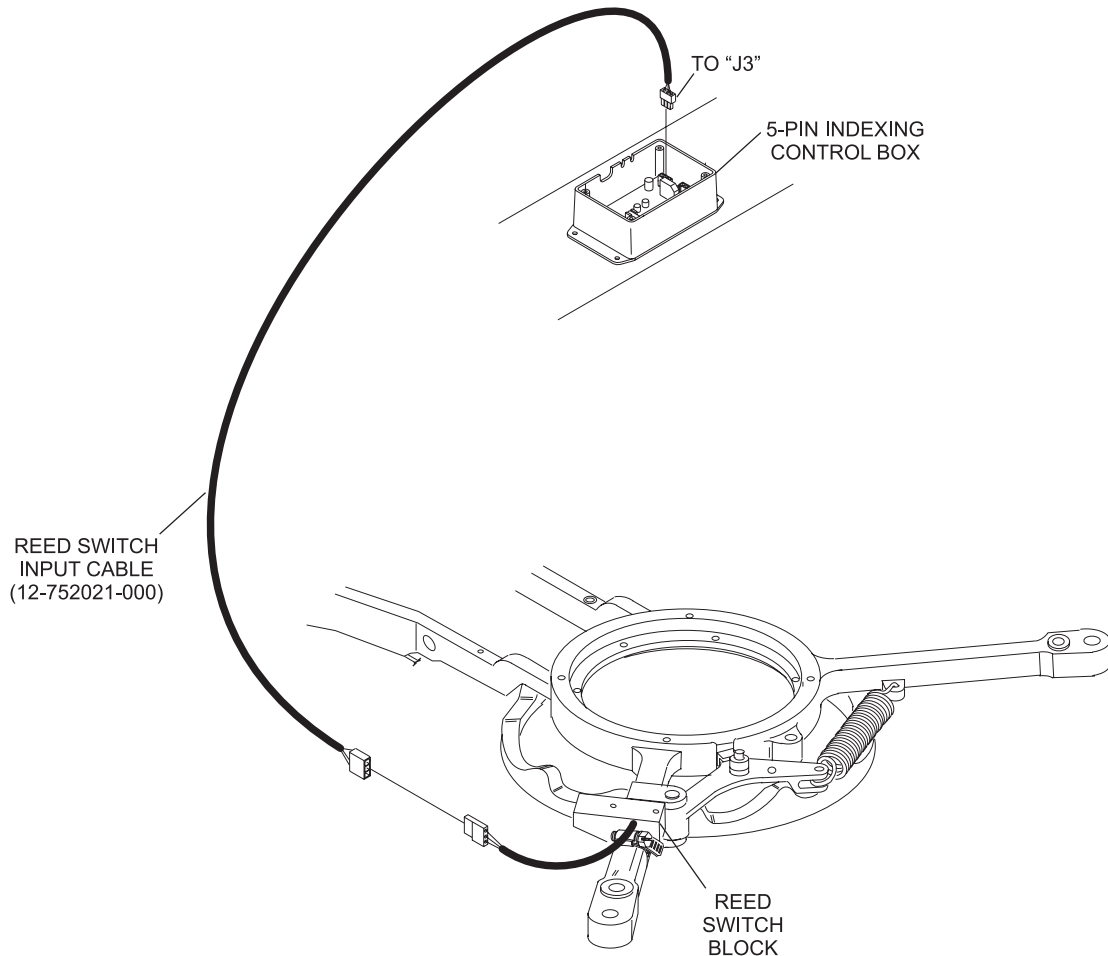


Figure 11

4. Replace the cover of the circuit board enclosure. Be sure that the full “lip” of the clear cover runs across the wire slots in the enclosure to act as a wire strain relief. Refer to *Figure 12*.

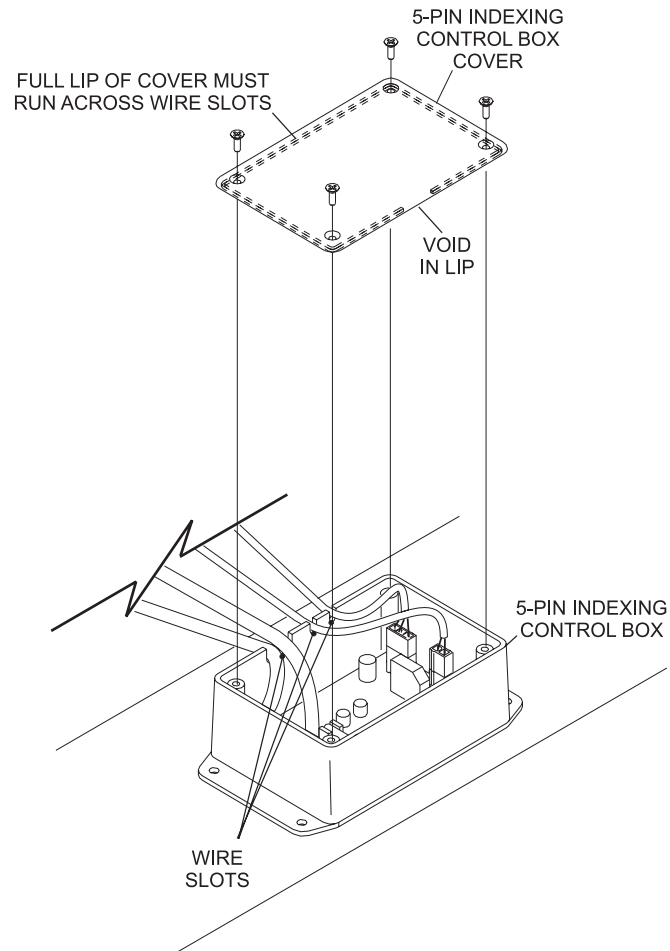


Figure 12

Testing

1. **For test run purposes**, disable the mechanical 5-pin indexing by bending the torsion latch trip lever up to miss the torsion latch as the 5-pin releases. (When removing the indexing latch trip lever, add a couple of washer on top to take up the thickness of the Indexing Latch Trip Lever, or use shorter bolts as the old bolts may be too long and hit the frame.)
2. Reinstall the electrical box cover assembly, reconnect power to the pinsetter and turn the circuit breaker on.
3. The new PCB should show power up as indicated by the illumination of a red “POWER” LED, D3.
4. Cycle the pinsetter and watch the PCB as the 5-pin drops through the 5-pin chute.
5. There can be a small “dead” spot in the center of the Reed switch block. The position of the magnet may have to be adjusted to make sure the Reed switch activates each time the magnet comes into the switch’s proximity which fires the solenoid. When these locations are finalized, secure the magnet to the spoon with high quality contact cement and put a wrap of tape around the magnet/spoon for added security. This should be done after the system is fully installed and tested.
6. If the solenoid does not fire, see the “Board Diagnostics & Troubleshooting Guide..
7. Once proper system operation has been verified, continue by removing the parts that are no longer necessary for the 5-pin indexing operation.
 - Disassemble the turret clutch assembly as if you were doing your annual maintenance.
 - Inspect the condition of your bearings and linkages and replace (repair) as necessary.
 - Now reassemble the entire assembly omitting the following parts and changing the positions of the two bearings, moving the retaining ring bearing (currently on the bottom) to the top position. This will keep the bearing from falling downward while allowing the top pulley to rotate freely. Now move the non retaining bearing (currently on top) to the bottom position keeping the spacer between the bearings. This will allow the bottom pulley to rotate freely. Make sure the main clutch bolt is tight. There will still be some up and down movement which is normal.

The following parts are no longer needed (*Figure 13*):

- 12-150159-000 Clutch Friction Disc Assembly.
- 12-150004-000 Spring Guide Assembly.
- 12-150222-000 Compression Spring
- 12-150138-000 Time Delay Gear
- 12-150011-000 Torsion Latch Assembly
- 12-150079-000 Trip Lever

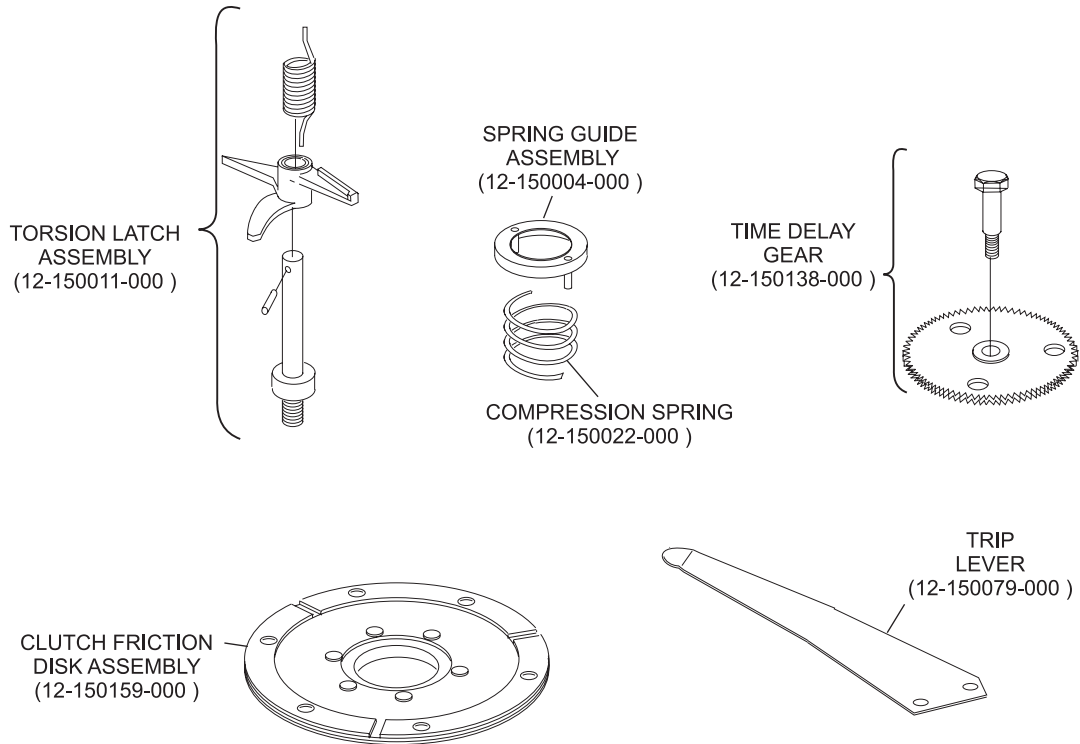


Figure 13

This new configuration allows greater rearward adjustment of the stop latch and creates longer usable life of the short turret belt.

- Replace the turret protection bottom cover.

Annual maintenance:

Inspect all linkages and x-washer pins and lubricate, repair or replace as necessary.

Troubleshooting

The purpose of this document is to detail diagnostics and troubleshooting for the Electronic Five Pin Indexing Kit for A2 pinsetter.

The following information will explain basic troubleshooting for 5-pin Indexing Board. An instrument that can measure DC and AC voltage such as a multi meter is required for proper troubleshooting.

Electronic 5-Pin Indexing Kit Description

The Electronic Five Pin Indexing kit is built with an electronic delay board as the center of the Electronic Five Pin Indexing System. The Electronic Five Pin Indexing Board is connected to 24Vac power, Reed switch and 115 volt AC solenoid. When the Reed switch senses the magnet on the #4 spoon of the turret, the Reed switch will activate a 0.8 – 1 second delay. After the time delay, the solenoid will pull the lever on the turret indexing bell crank releasing the pins to the deck. The 5-pin indexing board sends 115 volt AC to the solenoid which will be energized for about 0.5 to 0.6 seconds.

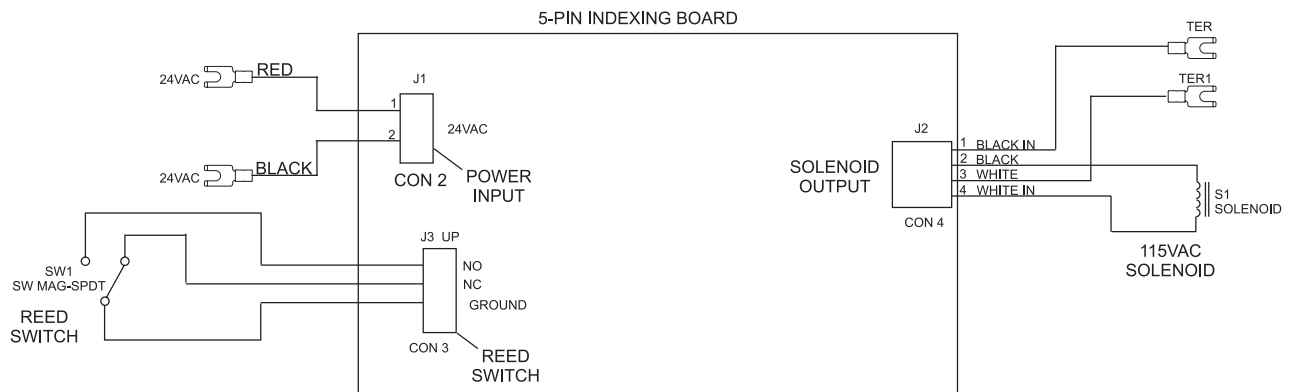


Figure 1

Troubleshooting and Diagnostic Procedure

In the following article we will explain basic troubleshooting for the Electronic Five Pin Indexing Board. For correct troubleshooting a multi-meter instrument that can measure both DC and AC voltage will be needed.

Light Emitting Diode LED's

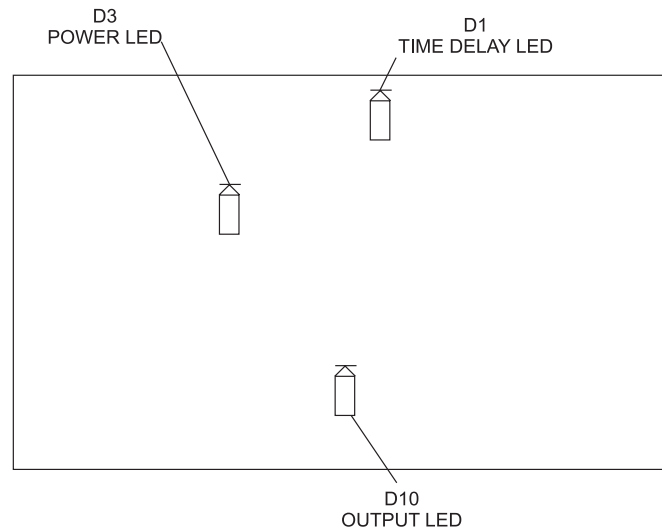


Figure 2

The 5-pin indexing board is assembled with 3 light emitting diodes (LEDs) for easy troubleshooting. Refer to *Figure 2*.

LED D1 - is lit if the Reed switch is activated. The diode is lit for about 1 second before the output solenoid is powered up.

LED D3 - is always lit when power to the Electronic 5-pin Indexing board is present. The board is powered with 24 volt AC from the low voltage transformer. The power to the board is coming from the low voltage terminal strip TS2, terminals 6 and 9. See installation manual. The 5-pin indexing board regulates the 24 volt AC input voltage to +12 volt DC. If voltage is present, LED D3 will be lit.

LED D10 - is lit when the signal to power up the solenoid is present. It is a short pulse of about 0.5 seconds that will energize the solenoid. The LED will not be lit until after the delay LED D1 is off. Both LED D1 and D10 should never be lit at the same time.

Fuses

The 5-pin indexing board is assembled with an input and an output fuse. The power input fuse is a PTC type resettable fuse and the output to the solenoid is protected with a 2A slow blow 5X20mm fuse.

LED'S REF. NO OR FAILURE	FUNCTIONS	FUNCTIONALITY DESCRIPTION	FAILURE MODE	CORRECTIVE ACTION
D3	Board Power LED	Red light on, the board is ready for operation and +12VDC is present.	If LED is not lit, the board is not powered up and is not functional +12VDC is not present on the electronic board.	Check the power cables and connections to the board. Refer to Installation manual. Check the main power switch and fuse on A-2 electrical enclosure.
D2	Magnetic reed switch and delay function	Red light on reed switch is activated and the delay function of 1 second is started.	If LED D1 is not lit the magnetic reed switch is not activated when needed and there is no delay.	Check the reed switch cable the position of the reed switch and magnet alignment. Refer to Installation manual
D10	Output signal to the solenoid	Red light is ON output to solenoid is activated for 0.5 seconds.	LED D10 is not lit after D2 there is no output signal to power up solenoid.	Check if the delayed LED D2 is lit for about 1 second, if not, check the reed switch cable and magnet position.
SOLENOID IS NOT ACTIVATED			LED D10 is lit for about 0.5 seconds but solenoid is not powered up.	Check 2A fuse F2 on board. Check solenoid cable is correctly connected. Refer to Installation manual.
SOLENOID IS DOUBLE TRIGGERED			LED D2 is lit for shorter time less than 1 second or it has double blink possible failure or double index.	Check the reed switch cable and magnet position on turret. Secure the magnet in correct position and manually rotate turret to check correct indexing.

Table 1 Troubleshooting and Diagnostics