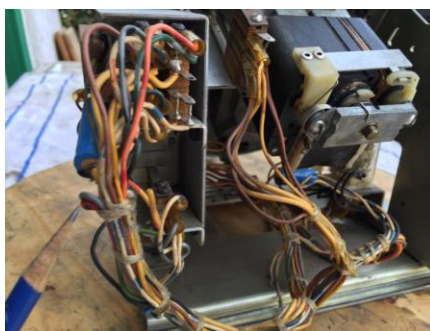


Wiring

There are 82 different wire color combinations used. These wire color codes are shown on a schematic with a two-digit number. The first number represents the solid color. The second number shows the tracer color (the stripe) running down the wire. For example, a **20** wire is a blue wire with no tracer. A **26** wire is a blue wire with a brown tracer. A **70** wire is a solid orange wire with no tracer. An **87** wire is a black wire with an orange tracer. The wire number is shown in a black rectangle in white numerals. Certain color codes are the same on all Bally slot machines. For example, 115 volts (line voltage) is always a black wire and a white wire (**80** and **50**, respectively). The black is the "hot" side, and the white is the "neutral" side. The black wire leading into the Bally machine must **always be fused and then switched, in that order**. The fifty and the eighty wire carry the mains. The **70** wire, orange with no tracer, carries 50 volts. All lamps have a **20** wire, blue with no tracer, attached to one of the terminals to supply 6 volts.

- 1 - Red (Rd)
- 2 - Blue (Blu)
- 3 - Yellow (Yel)
- 4 - Green (Grn)
- 5 - White (Wht)
- 6 - Brown (Brn)
- 7 - Orange (Orn)
- 8 - Black (Blk)
- 9 - Gray (Gry)
- 0 - No Tracer
- J - Jumper



Hopper wiring



Upper cabinet wiring



Wiring in reel assembly

Relays

Move only the static (nonmoving blade). Adjust the actuating (moving blades) only as a LAST RESORT. If the actuating blades are incorrectly adjusted, they will operate intermittently or buzz or not at all. Use only a switch bending tool on the static blade. Very fine needle-nose pliers can also be used. A gap of about 1/32 of an inch is needed for relays which are normally open (NO) during operation.

Verify this distance (with a feeler gauge) when the switch is open. For normally closed (NC) switches, the open gap is about 1/64 of an inch. When the switch opens momentarily by simply pushing the switch by hand (with the POWER OFF and the line cord unplugged), look to see this gap exists. Use a feeler gauge to verify the distance.



Upper cabinet relays - (1090 game)



Some [of many] reel assembly relays

Lamps

As the small glass lamps "burn out", replace all GE 44, GE 47 (both 6 volts), GE 55 (7 volts) and GE 63 (7 volts) bayonet bulbs with the LED bayonet, 6-volt equivalent. They are available in yellow or white. They will last for a very long time and do not burn hot. 7-volt, 9-volt and 12-volt LEDs work just as well. The illumination will be less bright and the heat generated less intense.

Thus, LED lamps will not damage the silk-screen printing of the glass on display in the slot machine. All lamps have a **20** wire, blue with no tracer, attached to one of the terminals.



From left to right:

GE 44, two LED lamps: (120 degree throw; 90 degree throw), GE 55, LED oblique view, LEDs top view

"120 degree throw" - the light is cast out at 120 degrees (more illumination)

"90 degree throw" - the light is cast out at 90 degrees

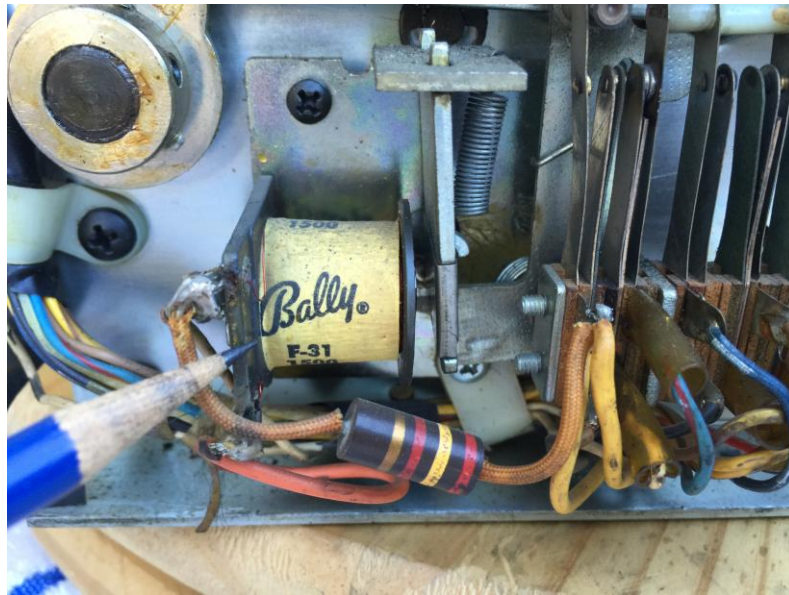
All of the lamps shown (except for the GE63, it has a BA15S base) have a BA9S base - a bayonet type

Electrical Component Function Chart

Actuator	Switches	Ready Phase
Coin Relay Coil	Coin Relay Switches	Latched
Coin Lockout Coil	Armature Only	Energized
Coin	Coin Switch	NC (Normally Closed)
Handle Release Relay	Handle Release Switches	Latched
Reel Mechanism Coil	"A" Switches	Closed
Reel Mechanism Coil	"B" Switches	Open
Reel Mechanism Coil	"C" Switches	Closed
Reel Mechanism Coil	Dashpot Switch	Closed
Reel Mechanism Coil	Snap Switch	Open
Coin Diverter Coil	Armature Only	De-energized
Payout Counter Reset Coil	Reset Pawl Switch	Open When Reset
Payout Counter Step-Up Arm	Payout Counter Step-Up Switch	Closed During the Stroke
Payout Counter Spiral Cam	Payout Counter Zero Switch	Open at Zero Count or Reset
Payout Relay Coil	Payout Relay	Closed During a Payout

Coils

Every coil in every Bally slot machine has a solid orange with no tracer **70** wire soldered to a terminal. This wire is common throughout the entire machine. It carries 50 volts AC to all of the coils. This voltage first passes through other switches before energizing a particular coil.



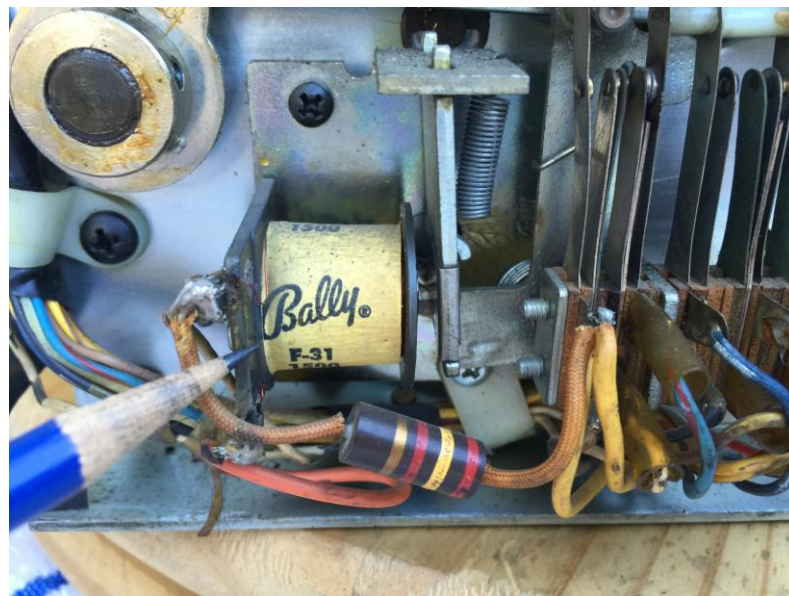
One of many coils in the upper, middle and lower assemblies of a Bally slot machine; this one is on the left side of the reel assembly

Resistors

There are some high wattage wire wound and carbon resistors in a Bally slot machine. They usually go bad when the component near them goes bad. When this happens, such a resistor will show infinite (open) resistance. Many surplus electronic stores carry replacements.



A wire wound resistor (tan, 10-watt) with two carbon resistors (in front of the relays); located on the hopper



The pencil is pointing to a coil, however, we are referring to the high-wattage carbon resistor (red-yellow-red) below this coil and located on the left side of the reel assembly

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Capacitors

Mica or tantalum capacitors NEVER need replacing.

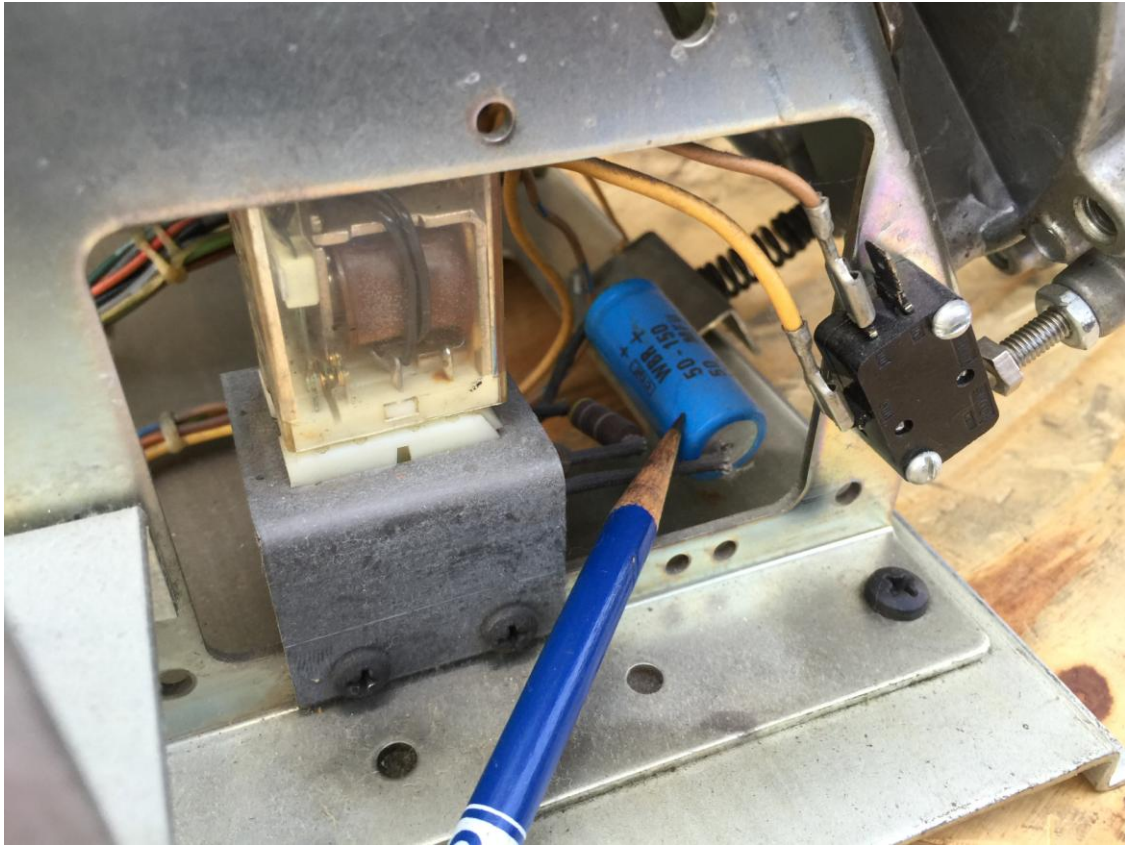
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Electrolytic Capacitors

Replace all electrolytic capacitors every five (5) years.



This capacitor is located in the hopper region

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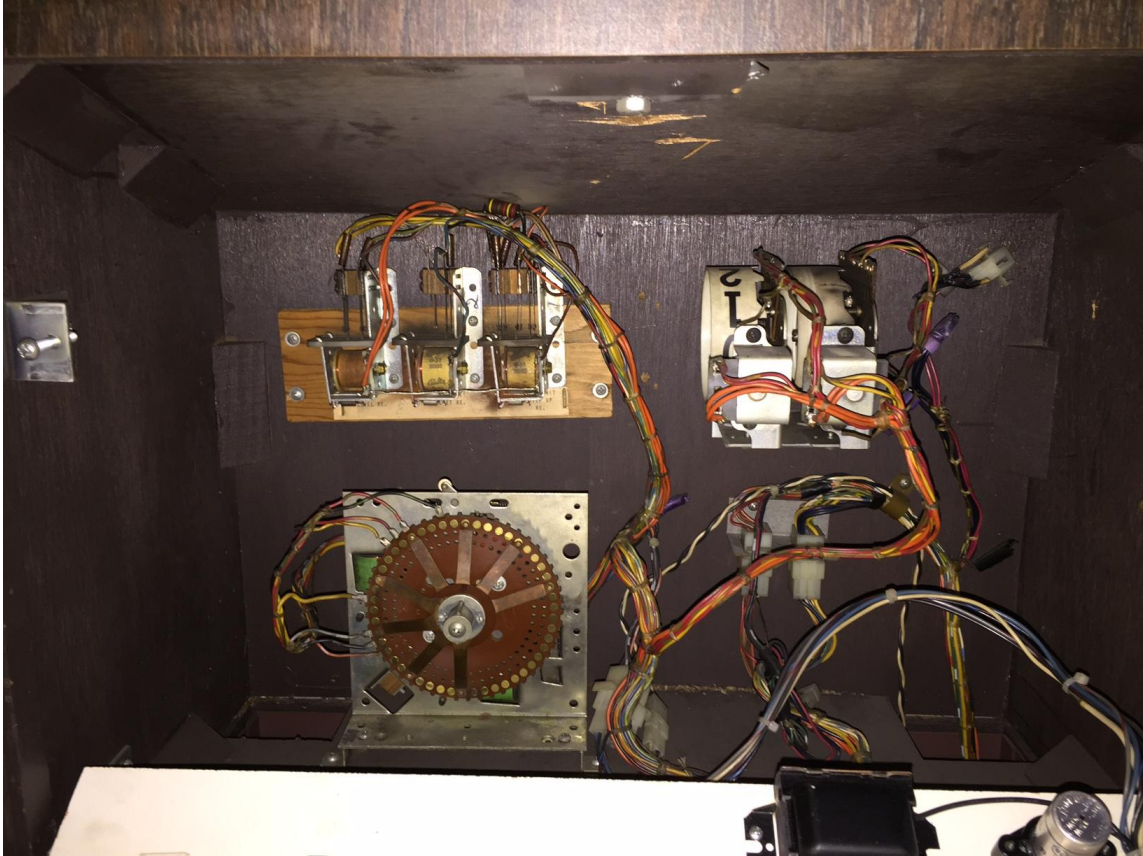
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Inductors

We are not aware of any inductors in any EM Bally slot machines.

Transformers

Transformers generally do not wear out. Be sure any transformer you work on is unplugged and isolated from "wandering" hands while inside the slot machine.



This transformer is in the upper cabinet of a Bally 1090. It provides voltage (50 volts) for the coils

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Fuses

Line (mains) - 5 ampere

Lamps (6 volts) - 8 ampere

Solenoids (50 volts) - 5 amperes

It is **EXTREMELY IMPORTANT** to replace fuses with the same amperage as the original! Fuses are available at any hardware, electronics or auto store.

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Molex Plugs

The plastic molded plugs become brittle over time. There are surplus electronic stores all over the US. Google "molex" plugs and very carefully compare what you have in your slot machine with any given diagrams/photos online.

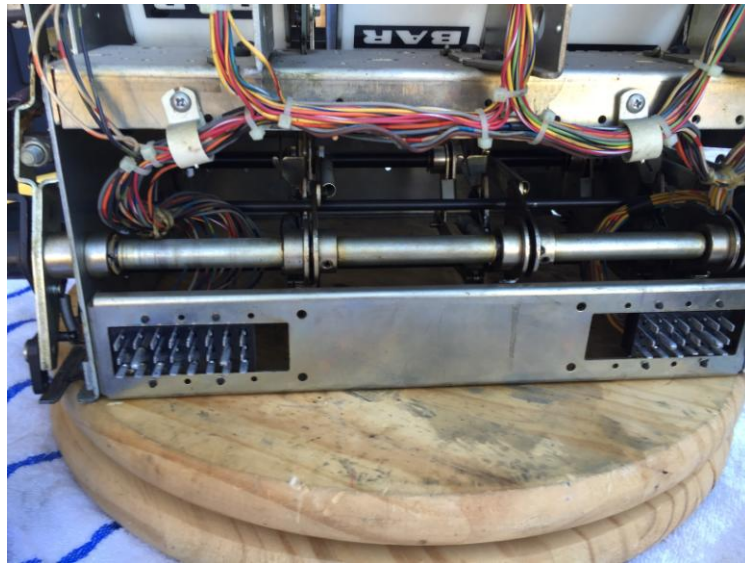
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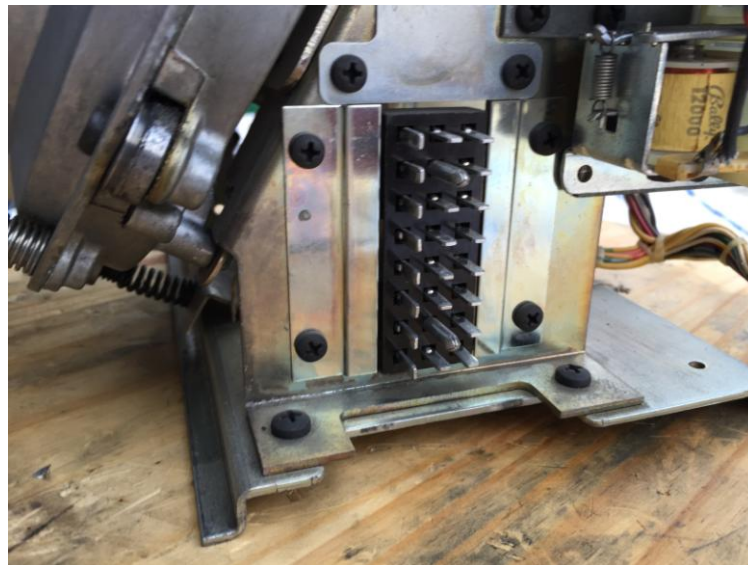
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Beau Plugs

Unfortunately, you are on your own if you damage a Beau plug. "Cannibalize" or unsolder a Beau plug from another slot machine that is used mainly for parts. **DO NOT** use a soldering gun to remove a Beau plug! Use an iron rated for 80 watts or less.



Beau plugs to the rear of the reel assembly



Hopper Beau plug

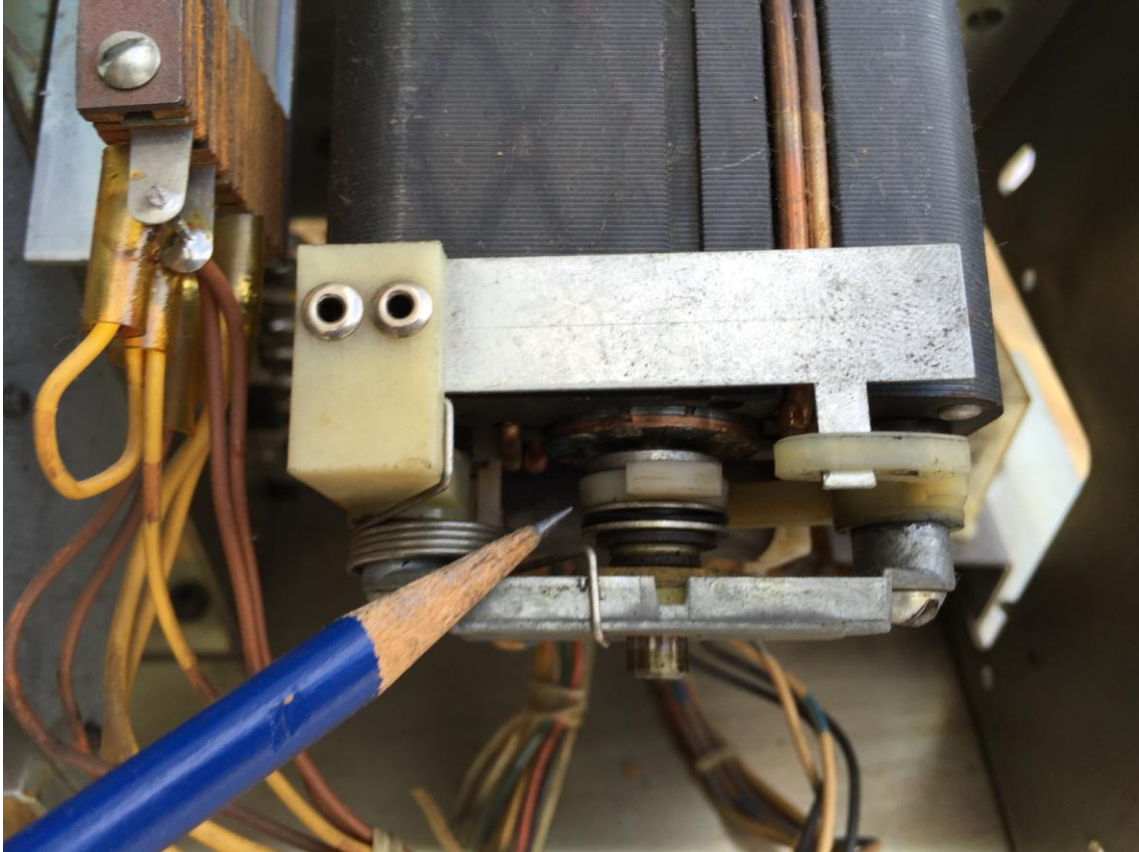
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Motors

Use several drops of a high quality (premium) sewing machine oil on the shaft of any motor. Spin the shaft by hand. Check for vibrations and securely tighten the screws of the motor to its frame.



Hopper motor shaft

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Stepper Switches

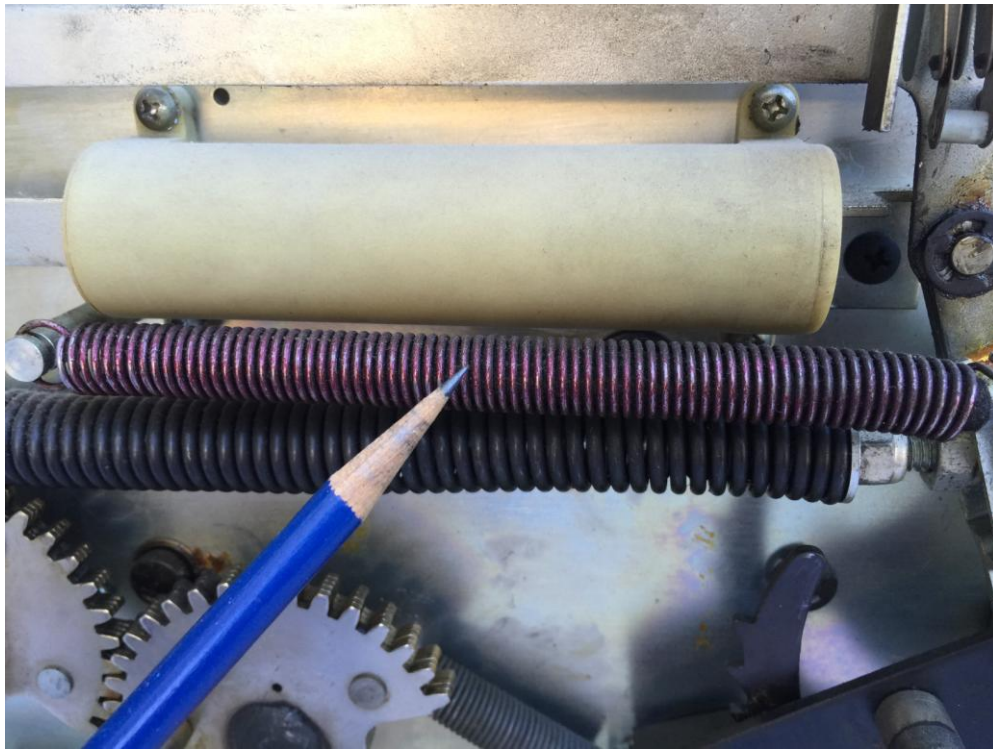
Clean the feelers and the wiper buttons with contact cleaner. **DO NOT** use a "water displacement" spray. **DO NOT** use sandpaper or steel wool to clean the contacts. Unfortunately, there are no more stepper switches being made for EM machines.



Stepper switches in upper cabinet

Springs

Replace springs with original springs from Bally. There are many surplus stores that carry springs for pinball games and such. Google the term "Bally springs". **DO NOT** use any other kinds of springs for other objects. **DO NOT** make your own springs.



Two [of many] springs in a typical Bally slot machine. These springs are on the right side of the reel assembly.

The red one is a trip lever extension spring with a felt plug somewhat protruding from the right end. (The plug prevents excess vibration during "kickoff" mode.) The darker spring below the red one attaches the cam half gear to properly mesh with the handle cam coupling gear.

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Microswitches

Many surplus electronic stores carry replacement microswitches. They are getting a bit more difficult to find. Not impossible, mind you, just difficult. Google "microswitches" to find the appropriate ones for your machine.



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Top Glass, Reel Glass, Belly Glass

Contact us! We still have glass for your Bally machines. Or, Google "Bally slot machine glass" to find it on many auction site.

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Fluorescent Lamps and Starters

Available at many hardware stores. Almost all Bally EM machines use an FS-5 starter.



These starters are found in many hardware stores.



Here is an 8-inch fluorescent tube used in nearly every Bally slot machine.

Use an FS-5 starter with all 8 inch tubes.

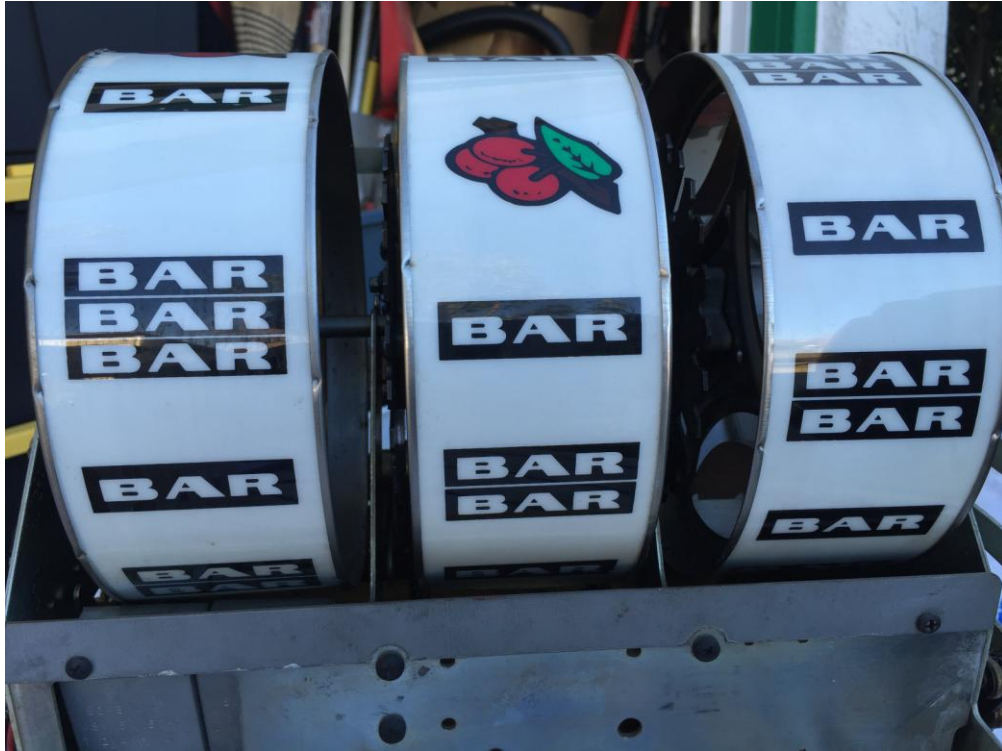
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Reel Strips

We have access to Bally reel strips. Or, Google "Bally reel strips" to find a distributor near you.



One of many types of reel strips. These are on a Bally 1090 slot machine.

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Schematic Diagrams/Service Manuals

Google "Bally EM schematics and service manuals". There are many available.