

# KICK OFF!



*Bally*

MANUFACTURING CORPORATION

2640 Belmont Avenue · Chicago, Illinois, 60618, U.S.A.

TELEPHONE (312) 267-6060/TELEX NO. 253076/CABLE ADDRESS: BALFAN



# *Warranty*

*MOTORS in new Bally products are guaranteed against defective materials or poor workmanship for 6 months from date of purchase. Any defective motors returned during the warranty-period will be replaced, without cost, by your Bally Distributor.*

*Bally*<sup>®</sup> **MANUFACTURING CORPORATION**  
2640 BELMONT AVENUE, CHICAGO, ILLINOIS 60618

## #1055 KICK OFF

### INSTALLATION AND GENERAL GAME OPERATION INSTRUCTIONS

#### INSTALLATION

On all games there are certain items that should be checked after shipment. These are visual inspections which may avoid time consuming service work later. Minor troubles caused by abusive handling in shipment are unavoidable. Cable plugs and sockets may be loosened, switches (especially tilt switches) may go out of adjustment. Plumb bob tilt switch should always be adjusted after game is set on location and leg levelers are adjusted.

Visual inspections before plugging in line cord:

1. Check that all cable plugs are firmly seated in proper sockets.
2. Check that cables are clear of all moving parts and relays.
3. Check for any wires that may have become disconnected.
4. Check switches for loose solder or other foreign material that may have come loose in shipment and could cause shorting of contacts.
5. Check wires on relay coils for proper soldering especially the bare (common) wire connecting a row of relay coils. Cold solder connections may not show up in factory inspection, but vibration in shipment may break contact.
6. Check that fuses are firmly seated and making good contact.
7. Check (manually) the stepping and resetting of all step-up units. The wiper action should not be sluggish.
8. Check the transformer for any foreign material shorting across wiring lugs.
9. Check wiring of transformer to correspond to location voltage. (Transformer wiring card in front cabinet).

Before line cord is plugged in:

Check all plugs and sockets and dress cables:

- (A) Plugs in correct sockets.
- (B) Plugs securely seated in sockets.
- (C) Dress cables away from relays.

Before line cord is plugged in:

Check all plugs and sockets and dress cables:

- (A) Plugs in correct sockets.
- (B) Plugs securely seated in sockets.
- (C) Dress cables away from relays.

Check adjustment of the three (normally open) tilt switches:

- (A) Panel tilt on bottom of playfield panel.
- (B) Plumb bob tilt on left side of cabinet near front door.
- (C) Ball tilt above plumb bob tilt. Insert the smaller ball (15/16" dia.) into the ball tilt assembly, and adjust the bracket so the ball will roll free to contact the switch blade, if front of cabinet is raised.

Plug in line cord:

Check adjustment of the (normally open) anti-slam switch on mounting board. Check adjustment of the (normally open) anti-slam switch, on front door. Check adjustment of the (normally open) anti-slam switch on tilt board. If either of those switches is closed, the delay relay is energized momentarily.

#### GENERAL GAME OPERATION

Place ball into playfield outhole.

Coin game:

If coin should be rejected move ON-OFF master switch at bottom right front corner of cabinet to "ON" position, then coin game. Coin lock out device rejects all coins when power (master switch) is off. Also check the delay relay. If this relay is energized the game will not accept coins.

- 1A. If game is adjusted for 1 coin/1 play, the coin relay will become energized when a coin is deposited.
- 1B. With the coin relay energized by the 1st coin, it will reset the complete game.
- 1C. Inserting the 2nd coin the coin relay is again energized and steps-up the coin unit to set-up the game for two players.
- 1D. Inserting the 3rd and 4th coins the above procedure is repeated to set up the game for the 3rd and 4th players.
- 2A. If game is adjusted for 1 coin/2 plays the coin relay will become energized and steps-up the credit unit 2 steps for each coin deposited.

- 2B. When the credit unit is advanced, the front door credit button switch (when actuated) will energize the credit relay will then energize the coin relay.
- 2C. The coin relay will energize the reset relay thru a game over relay switch, operate the score motor and then thru normally open #2 and #11 score motor switches, energize the #1 and #2 score reset relays. The reset relay will operate the score motor. Both the reset and the score reset relays will be energized thru a normally closed #8 score motor switch, or until all score counter units are reset to zero position.
- 2D. The coin relay, thru a normally open #4 score motor switch will advance the total play meter, and thru the reset relay will reset the coin unit, ball count unit and the player up unit. The coin relay will also reset the credit unit, (1 step) when energized by the credit button. Thru a normally open #4 score motor switch, it will energize the game over relay latch coil.
- 3A. A ball on the outhole switch, at the start of game will energize the outhole relay thru a normally closed #1 score motor switch, and it will stay energized thru its own hold-in and a normally closed #8 score motor switch. For operations after the first ball, see under heading "Sequence of Operation".
- 3B. When the outhole relay is energized, it will operate the score motor and then energize the outhole kicker solenoid thru a normally open #7 score motor switch. The ball will be kicked thru the ball trough to the shooter alley. The game is ready for the first player to play.
- 3C. To condition the game for 2nd player, inserting coin(s) or using the credit button before the 1st ball is played, will energize the coin relay again. This time, the coin relay will not energize the reset relay. It will operate the score motor, advance the total play meter, subtract a credit from credit unit, (if credit button was used) and advance the coin unit thru a normally open #4 score motor switch. The game is now set for 2 players; repeating this sequence will set game for 3rd player and 4th player.

#### SEQUENCE OF OPERATION

- 1A. When a ball is played, the ball index relay will be energized thru the 10 point, 100 point or 1,000 point score relay and it will stay energized thru its own hold-in switch and normally closed #6 score motor switch and a normally closed outhole relay switch.

1B. When the ball goes into the outhole:

- a) The bonus score relay is energized and operates the score motor to add the bonus score to the total score of the player. When the scoring is completed, this bonus score relay is de-energized and the outhole relay is energized. The outhole relay will remain energized thru its own lock-in switch until the normally closed #8 score motor cam switch opens.
- b) The outhole relay will advance the player up unit thru #4 score motor cam switch, if more than one player is playing and no extra ball has been scored.
- c) The outhole relay will advance the ball count unit thru #3 score motor cam switch after the last eligible player has played if no extra ball was earned, the extra ball must be played off before the ball count unit will advance. When the ball count unit has advanced, the player up unit will reset thru #4 score motor cam switch.
- d) The outhole relay when energized will operate the score motor and thru #7 score motor cam switch it will energize the outhole kicker solenoid which will eject the ball from the outhole to the shooter alley. The outhole relay thru another #6 and #7 score motor cam switch will advance the bonus unit from zero to 1,000 position. The outhole relay when energized will de-energize the ball index relay, the extra ball relay and the tilt relay.

#### FEATURE OPERATION AND SCORING

##### BONUS SCORES

A bonus score of 1,000 to 15,000 may be scored. The game starts with a bonus of 1,000. The bonus score advances one step each time the ball reaches a yellow ball position on the soccer field.

The ball on the soccer field advances one position each time the spinner lites complete one sequence; each sequence is completed by lighting the last (10th) spinner lite. The ball is also advanced once by hitting the upper left target. The ball can be advanced three positions by either going thru a top lane when lit or hitting the lower left target when lit. When the ball goes into the outhole, the lit bonus score is added to the player's total score; if the double bonus lite is lit, twice the lit bonus score is added to the player's total score.

### DOUBLE BONUS

A Double Bonus is scored on either the 3rd or 5th ball depending on the adjustment of the double plug.

### SKILL SHOT

To achieve a high score when the ball is in the shooter alley, the ball should be released so that the ball will enter a lit lane which will advance the ball on the field three (3) positions.

### DROP TARGET FEATURE

Knocking down all the drop targets will either score a goal or a special. When the drop targets are lit for a goal the last drop target down will score the lit goal value. The goal value reads 5,000 - extra ball - special. The first goal is worth 5,000 points, the second goal is worth an extra ball and the third goal is worth a special.

### EXTRA BALL FEATURE

The game will award an extra ball on the second goal. Only one extra ball is awarded at any one time; the extra ball must be played off before another extra ball can be scored. The game is adjustable to award an extra ball when a pre-adjusted hi-score is registered or through the special feature. (See below).

### SPECIAL FEATURE

The "Special" award is scored when the drop targets are lit for special and the last target is knocked down. A special is also scored when the bonus goes to 15,000. The special award is adjustable to score a credit or an extra ball.

PARTS LIST

MISCELLANEOUS

Transformer (Domestic) E-122-124  
Transformer (Export) E-122-123  
Score Motor (Domestic) E-119-354  
Score Motor (Export) E-119-460

RELAY COILS

G-30-1500  
Score Reset (2)

G-31-1600  
Game Over (Trip)  
Delay  
Over the Top

G-31-2000  
Coin  
2nd Coin  
3rd Coin  
Credit  
Reset  
Game Over (Latch)  
Player Reset  
10,100, & 1000 Point  
500  
5000  
Bonus Score  
Outhole  
Double Bonus  
30 Yard  
Goal  
Goal Control  
Targets Down  
Spinner

G-32-2500  
Ball Index  
Tilt  
Extra Ball  
Target Sequence

G-33-2800  
Lock

ASSEMBLY COILS

AP-25-850  
Outhole Kicker  
AF-25-500  
28-1000  
Flippers (4)  
AK-27-1300  
Sounder  
AP-27-1300  
Thumper Bumpers (3)

B-26-1100

Ball Count Unit Step Up  
Credit Unit Step Up  
Bonus Unit Step Up  
Player Up Unit Step Up  
Coin Unit

CD-29-1600

Ball Count Reset  
Bonus Unit Reset  
Credit Unit Reset  
Player Up Unit Reset  
Coin Unit Reset  
Score Drums (16)  
00-90  
Spinner

CG-29-1600  
Chimes (3)

N-24-800  
Drop Target  
Reset Coils (2)

FC-33-2600  
Coin Lock Out

UNIT DISC

Ball Count	W-1043-30
Coin	W-923-260
Player Up	W-923-440
Bonus	W-1072-51
00-90	W-999-28 & 29
Spinner	W-999-39

UNIT WIPER ASSEMBLY

Ball Count	AS-1046-806
Coin	AS-1024-108
Player Up	AS-1046-809
Bonus	AS-1046-807
00-90	A-1618-3 & 4
Spinner	A-1618-3



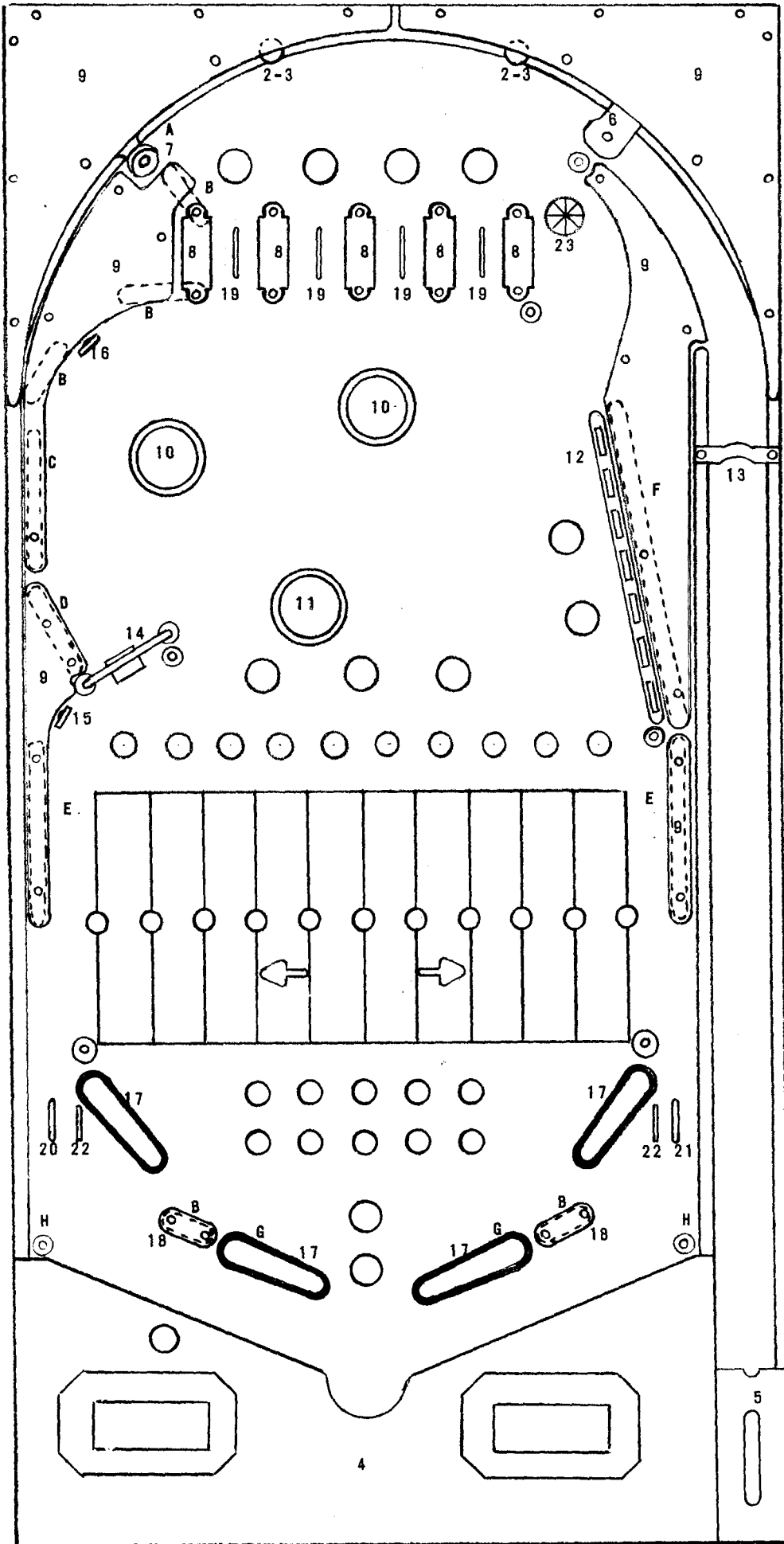
#1055 KICK-OFF

RUBBER PARTS

A	R-115-4	REBOUND	
B	R-521-1	1" DIA.	(5)
C	R-521-2	1-1/2" DIA.	(1)
D	R-521-3	2" DIA.	(1)
E	R-521-4	2-1/2" DIA.	(2)
F	R-521-7	4" DIA.	(2)
G	R-406-3	FLIPPER	(4)
H	R-243-2	5/16"	(2)

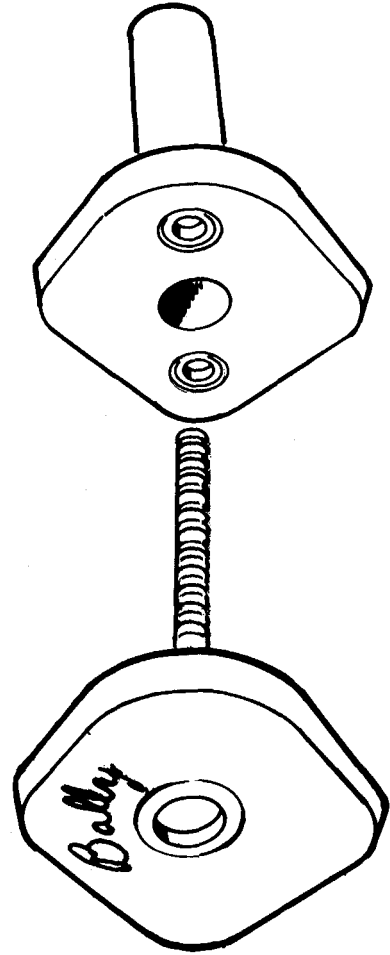
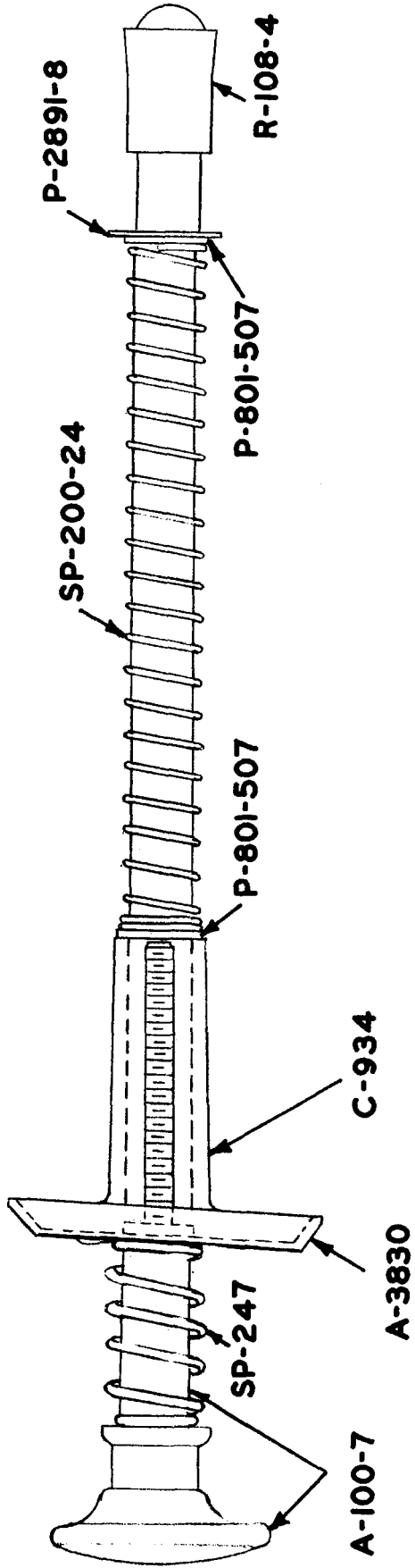
PANEL TOP PARTS

1	ARCH RAIL	M-1774
2	RAIL POST	C-907
3	RAIL POST CAP	C-908
4	BOTTOM ARCH	P-5871-52
5	SHOOTER GUIDE	P-6358-18
6	BALL GATE	A-1475-9
7	BALL REBOUND	AS-483-6
8	PLASTIC GUIDE (5)	C-695-1
9	SCREENED PLASTICS (SET)	A-2890-113
10	THUMPER CAP (2)	A-3713-24
11	THUMPER CAP (1)	A-3713-25
12	DROP TARGET UNIT	AS-2795-7
13	LANE HOOD	P-1732
14	SPINNER GATE	AS-2250-37
15	TARGET ASSEM. YELLOW	AS-982-740
16	TARGET ASSEM. WHITE	AS-982-806
17	FLIPPER & SHAFT (4)	AS-2214-24
18	PLATE (2)	P-5899-38
19	ROLLOVER WIRE ASSEM. (4)	AS-2806
20	ROLLOVER WIRE ASSEM.	AS-2806-9
21	ROLLOVER WIRE ASSEM.	AS-2806-10
22	BALL GUIDE (2)	C-824-5
23	ROLLOVER BUTTON	C-900



# NEW BALL SHOOTER ASSEMBLY

PART NO. AS-2378-5



SHOOTER HOUSING COVER

PART NO. A-3830

SHOOTER GUIDE HOUSING

PART NO. C-934

## A) Schematics

The schematic as drawn shows the power-off condition. The lock relay is de-energized. The lock relay will become energized when the power is turned on. The general illumination lights will now light. The schematic should be used to localize the area of interest for any given fault. For example, if the game were coined and the credit button pressed, the game over relay should be latched. If not, the trouble could be in the motor switches or the lock relay. Visual inspection will usually reveal the source of the trouble. A volt-ohmmeter will always locate the trouble.

The schematic, therefore, allows us to trace each circuit through the game to the power source (the transformer secondary). A color code is given for each lead to facilitate this tracing in the game.

The numbers on the bottom of the schematic and the letters on the left hand margin of the schematic can be used with the coil location chart at the right hand side to locate relays and solenoids. If the coil number is not recognizable in the game, the schematic will give the number for reordering (for example, reset relay G-31-2000). The nominal resistance of each relay coil is also given.

Score motor operation is detailed on the schematic. The score motor is used in the coining, reset and scoring operations. The sequence of operation table indicates that the score motor, when energized, will actuate contacts associated with cams one through twelve in the positions indicated. Cam #1 is physically closest to the motor. Cam switches are lettered alphabetically starting with "A" for the bottom of a switch stack. For example, the switch 2C, SCM, on the schematic is driven by the cam in the second position from the motor and is physically the third switch assembly above the cam in the switch stack. It is actuated by the score motor driven second cam in positions 1, 2, 3, 4 and 5.

The motor receives a starting pulse from various sources. It will index itself one-half revolution (180°) by means of self holding switch associated with Cam #1.

Relays shown on the schematic are shown de-energized. A relay consists of a coil of wire (electromagnet, when energized) armature or heel plate, plastic switch actuator, switch assemblies and frame. When the coil is energized, the armature is pulled to the coil by the electromagnetic force created by the current flowing through the turns of the coil. The plastic switch actuator is connected to the armature. The moving armature pulls the actuator and the long switch blades to the energized position. Contacts that were closed in the de-energized are opened in the energized position and vice-versa. In general, Bally relays are designed to self-hold or remain energized through a contact in the stack after the source of initial energization is removed.

## B. ASSEMBLY ADJUSTMENTS

### 1. General

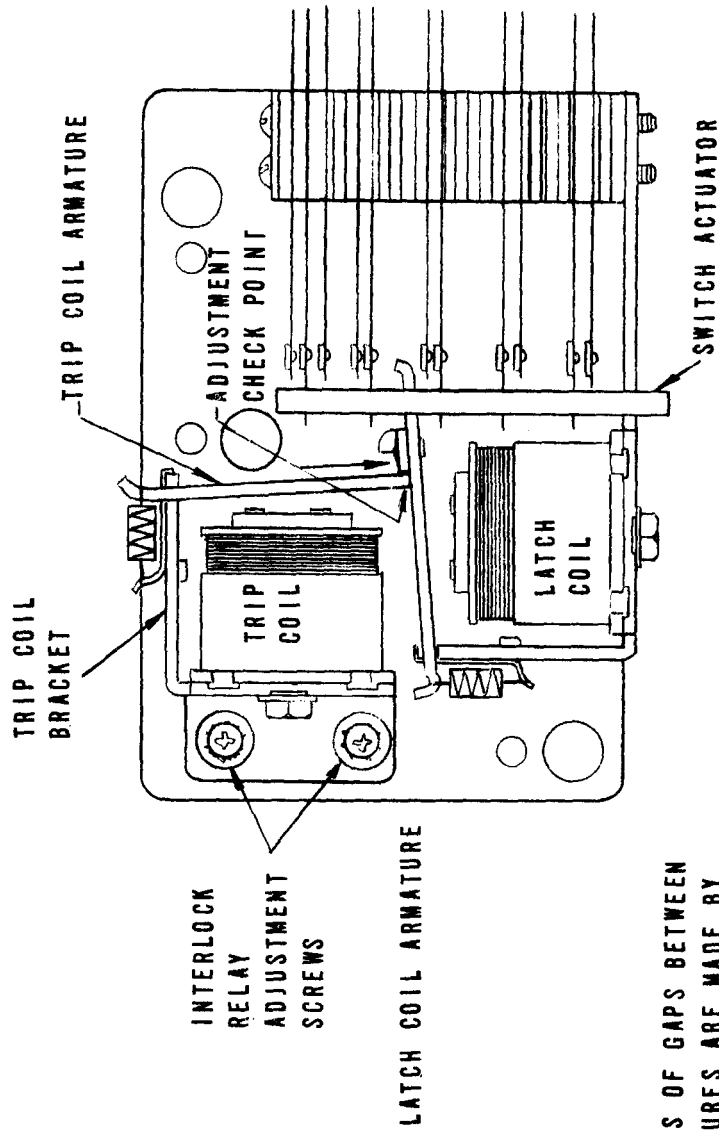
All switch assemblies consist of leaf springs, contacts, separators, plastic tubing and screws to hold them to the mounting surface on the relay frame. Before attempting to adjust a switch assembly, make sure that these screws are tight. If not, tighten screw closest to the contact end of the leaf spring first. This will prevent the assembly from being secured in such a manner that the leaf springs tend to fan out. In general, all leaf springs are adjusted for a 1/32" gap in the open position and .010" overtravel or wipe in the closed position. All contacts should be in good condition. Unless otherwise instructed, they should be dry or non-lubricated. All contacts should be free of dust and dirt. Tarnish can be removed with a contact file followed by a burnishing tool. Severely pitted contacts must be replaced as an assembly. In general, contacts need be cleaned or replaced and adjusted when they are found to be a source of game malfunction.

### 2. Relays

All of the above applies. Relay contacts are operated dry. Beyond the normal 1/32" gap adjustment, relays with a self-holding circuit must be adjusted such that the self-holding contacts make just before the other contacts (adjust to .025" gap). Care in making this adjustment prevents false crediting and false scoring during the game.

The game-over relay is an example of an interlock relay. Interlock relays are adjusted for a .010" gap between the trip and latch coil armatures in the trip position and a .010" gap between the nylon on the latch coil armature and the trip coil armature in the latch position. If an adjustment is necessary, the interlock relay adjustment screws should be loosened and the trip coil repositioned until the trip and latch armature gaps are proper. The screws are then secured. Always check the switch adjustments after a gap adjustment is made. Open contacts should have a 1/32" gap. Closed must show .010" overtravel.

BALLY INTERLOCK RELAY



WHEN THE LATCH ARMATURE IS HELD DOWN DIRECTLY OVER THE CENTER OF THE LATCH COIL, THERE SHOULD BE A .010 GAP BETWEEN THE TRIP COIL ARMATURE AND THE NYLON PIECE OF THE LATCH COIL ARMATURE AT THE ADJUSTMENT POINT.

WHEN THE TRIP COIL ARMATURE IS HELD DOWN AND THE LATCH ARMATURE IS RELEASED, THERE SHOULD BE A GAP OF ABOUT .010 BETWEEN THE TWO ARMATURES.

ADJUSTMENTS OF GAPS BETWEEN THE TWO ARMATURES ARE MADE BY LOOSENING THE INTERLOCK RELAY ADJUSTMENT SCREWS. BE SURE TO TIGHTEN DOWN THE SCREWS AFTER ADJUSTMENT IS MADE.

ALWAYS CHECK SWITCH ADJUSTMENTS WHENEVER A GAP ADJUSTMENT IS MADE.

FIGURE 1 - 2 INTERLOCK RELAY ADJUSTMENTS

### 3. Printed Circuit and Riveted Disc Units

Examples of these are the bonus, the player up, the ball count, the coin and the 00-90 units. The force exerted on the disc contacts by the rotor requires lubrication of the disc contacts. Periodic maintenance must include an inspection for the presence of lubrication and for contact condition. Touching the contacts with the fingers should result in a shiny trace on the finger. This, and absence of contact pitting and dirt indicate a satisfactory operating condition. Contact pitting can be corrected with a contact file and burnishing tool. Dirt should be removed with a clean, lint free cloth. If contact cleaning fluids are used to remove greasy dirt, a cloth must be used to remove any chemical residue. Finally, apply Bally coin machine lubricant to a clean cloth. Apply a thin film to the contact surfaces.

If, in trouble shooting, a rotor blade is suspected as the source of the problem, it can be checked for proper adjustment. A blade exerting too little pressure can be intermittent. A blade exerting too much pressure may slow or stop the rotor. A check for the force exerted by the rotors can be made as follows: gently warp the disc or printed circuit board away from the rotor. The rotor blade should follow the disc or board for 1/32" before contact is broken. If it follows further, contact force is too great. If it breaks contact too soon, contact force is not great enough. Use a contact adjusting tool to adjust the rotor blade pressure.

### 4. Credit Unit

The credit unit is used to store in memory the number of credits or games due a player. Credits are payed for or won for high score, match feature or as a special game feature. Improper adjustment of the credit unit can result in too many or too few credits issued to the player. To check for proper adjustment of the credit unit: (See Figure III-3)

- a) Slowly hand actuate the step-up plunger. The step-up arm must not engage the next tooth on the ratchet (occasional engagement is acceptable). If the step-up arm does, gently bend the base plate tab down (away from the step-up solenoid) until hand actuation does not cause consistent engagement of the next tooth on the ratchet. This adjustment, properly made, prevents multiple crediting when only one credit is due the player.

CREDIT (REPLAY) UNIT

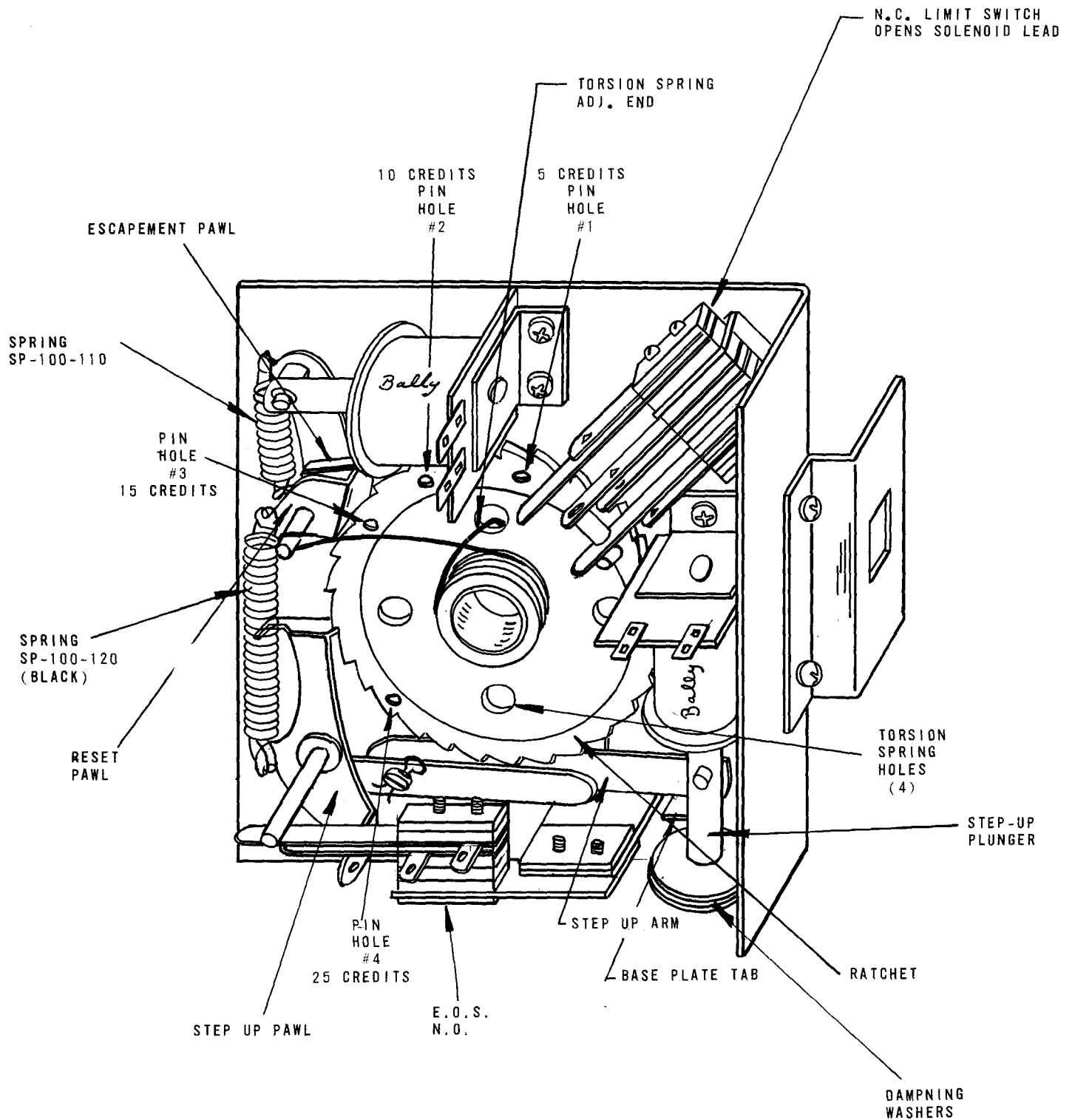


FIGURE III - 3 CREDIT UNIT ADJUSTMENTS

- b) If multiple crediting persists, increase spring tension by moving the ratchet torsion spring (short end) one hole or 1/4 turn clockwise to the next hole. This will slow the ratchet wheel and decrease the probability of multiple crediting.
- c) If the credit unit does not return to zero, check the adjustment of the switch stack just above the step-up solenoid. If the force exerted by the blades in this stack is excessive, the credit unit will not return to zero. Adjust the stack for a 1/32" gap when the credit wheel is not on zero, and a .010" overtravel at zero. Now spin the credit wheel by hand for the maximum allowable number of credit. The normally closed switch in the stack must now be opened by the pin in the ratchet wheel. This switch is the limit switch and opens the lead to the step-up solenoid.
- d) If two or more credits are subtracted each time the credit button is actuated, the spring (SP-100-110) that positions the escapement pawl is too strong. Gently spread the turns on the spring until the proper action is obtained.

It is to be noted that selection of the #1, 2, 3, or 4 pin hole will limit the maximum number of credits possible to 5, 10, 15 or 25 as desired. This pin actuates the limit switch on the switch stack.

#### 5. Score Drum Unit Adjustment (See Figure III-4)

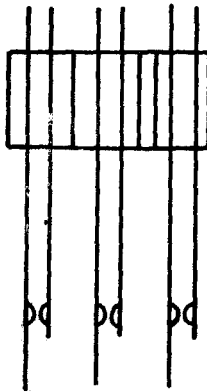
All score drum unit assemblies are essentially the same. End of stroke switches are adjusted for a 1/32" gap and .010" overtravel (wipe) at the end of the solenoid stroke. The switches in the stack are adjusted likewise. Note that if the solenoid plunger is actuated by hand, all switches are open in the zero position, i.e., the numeral '0' in the viewing window on the insert. Malfunctions can be corrected by proper adjustment. Typical malfunctions are:

- a) Score drum continues to step through zero during the reset cycle (top switch in switch assembly always closed).
- b) Score drum does not score (second switch in switch assembly always open).
- c) Score drum and next higher drum advance simultaneously on a continuous or intermittent basis. This is proper when advancing from the 9th position to zero. For all other numerical positions it indicates that the last switch (closest to the metal frame) is always or intermittently closed.



SCORE DRUM UNITS SWITCHES

10-80, 100-900 & 1,000-9,000 UNITS (ALSO 10,000-90,000 UNIT WHEN 100,000 RELAY IS INVOLVED)



LOCK-IN FOR RESET RELAY  
CIRCUIT TO STEP-UP COIL  
DURING RESET CYCLE

ZERO  
SWITCHES

COMPLETES CIRCUIT TO ADVANCE  
NEXT HIGHER DRUM UNIT WHEN  
A SCORE OF '9' IS SHOWING, AND  
THE SCORE RELAY IS ENERGIZED  
TO ADVANCE THIS UNIT.

9<sup>th</sup>  
POSITION  
SWITCH

OPEN WHEN ZERO IS SHOWING

CLOSED WHEN 9 IS SHOWING

10,000-90,000 UNIT (EXCEPT IN GAME HAVING 100,000 RELAYS - SEE ABOVE)



LOCK-IN FOR RESET RELAY  
CIRCUIT TO STEP-UP COIL  
DURING RESET CYCLE

ZERO  
SWITCHES

OPEN WHEN ZERO IS SHOWING

FIGURE III-4 SCORE DRUM UNIT SWITCH ASSEMBLY

Score drums are easy to trouble shoot. A faulty unit can be found visually. Visual inspection and adjustment is adequate to correct the problem. Do not overlook cable dress as a source of the problem. Dress bare leads away from adjacent connections.

#### SECTION IV SERVICE PARTS

A parts catalogue is available upon request. The catalogue is illustrated and lists all replacement parts for each game manufactured by Bally. Requests should be addressed to:

BALLY MANUFACTURING CORPORATION  
2640 WEST BELMONT AVENUE  
CHICAGO, ILLINOIS 60618  
ATTENTION: PARTS DEPARTMENT

#### SERVICE HINTS

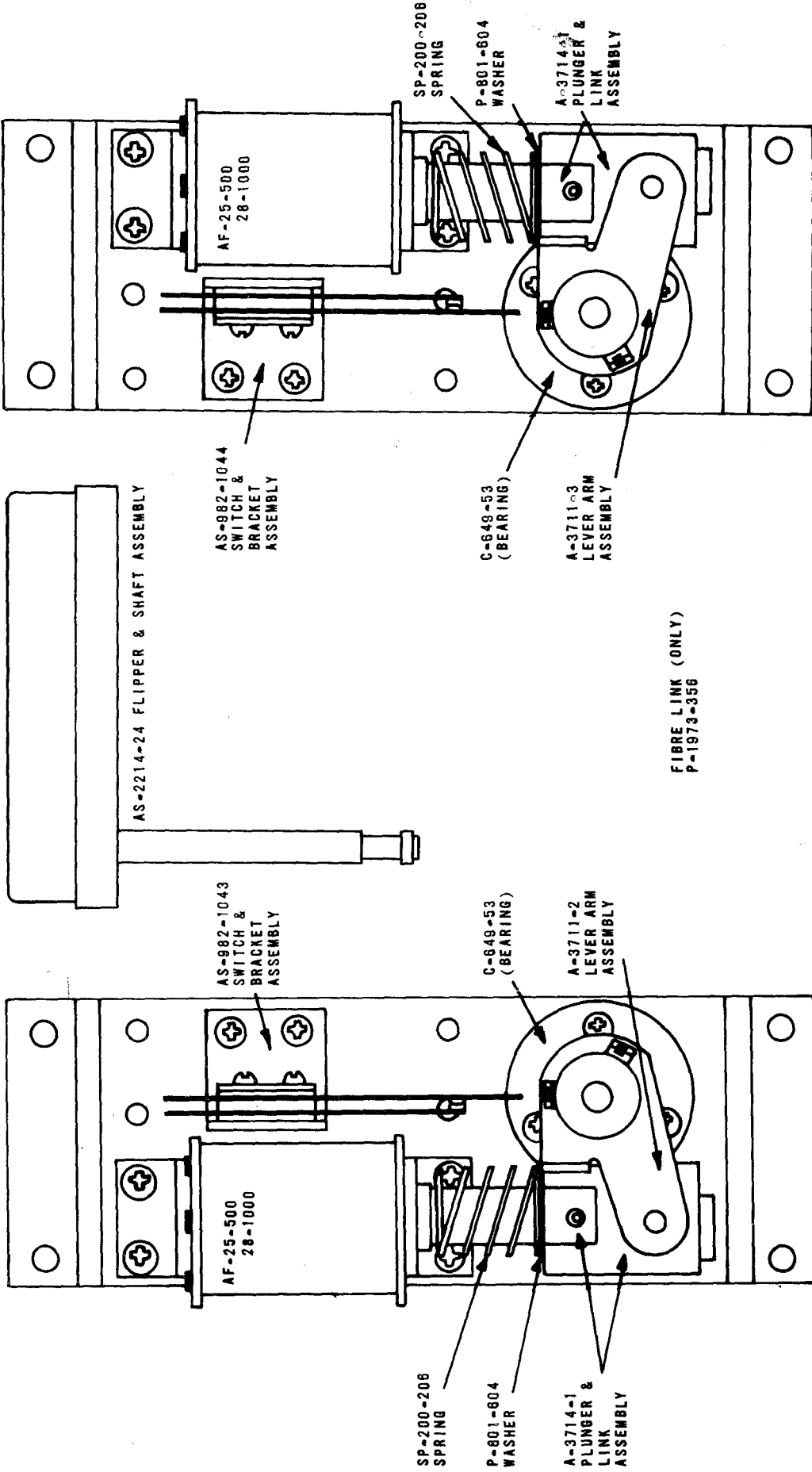
To maintain trouble free operation, all stepping unit contact plates, rivet and printed circuit type should be cleaned and lubricated sparingly every 30 days using Bally coin machine lubricant.

The Bally playfield has an improved tuff-coat finish with excellent wearing properties. It's life expectancy, as well as play appeal, can be extended by periodic cleaning of the playfield.

DO: Bally recommends you clean your playfield with Wildcat #125 (Wildcat Chemical Co., 1333 W. Seminary Dr., Ft. Worth, Texas 76115). Wildcat #125 is a combination cleaner and polish. Bally has tried and tested this product and found it to be very effective. If Wildcat #125 is not available, Bally suggests you ask your Distributor to order it. Inspect and hand polish the ball in a clean cloth. A chipped ball must be replaced. It can ruin the finish on the playfield in a short period of time.

DON'T: Use water in large quantities, highly caustic cleaners, abrasive cleaners or cleaning pads on the playfield. Do not allow a wax or polish build up. Waxes yellow with age and spoil play appeal.

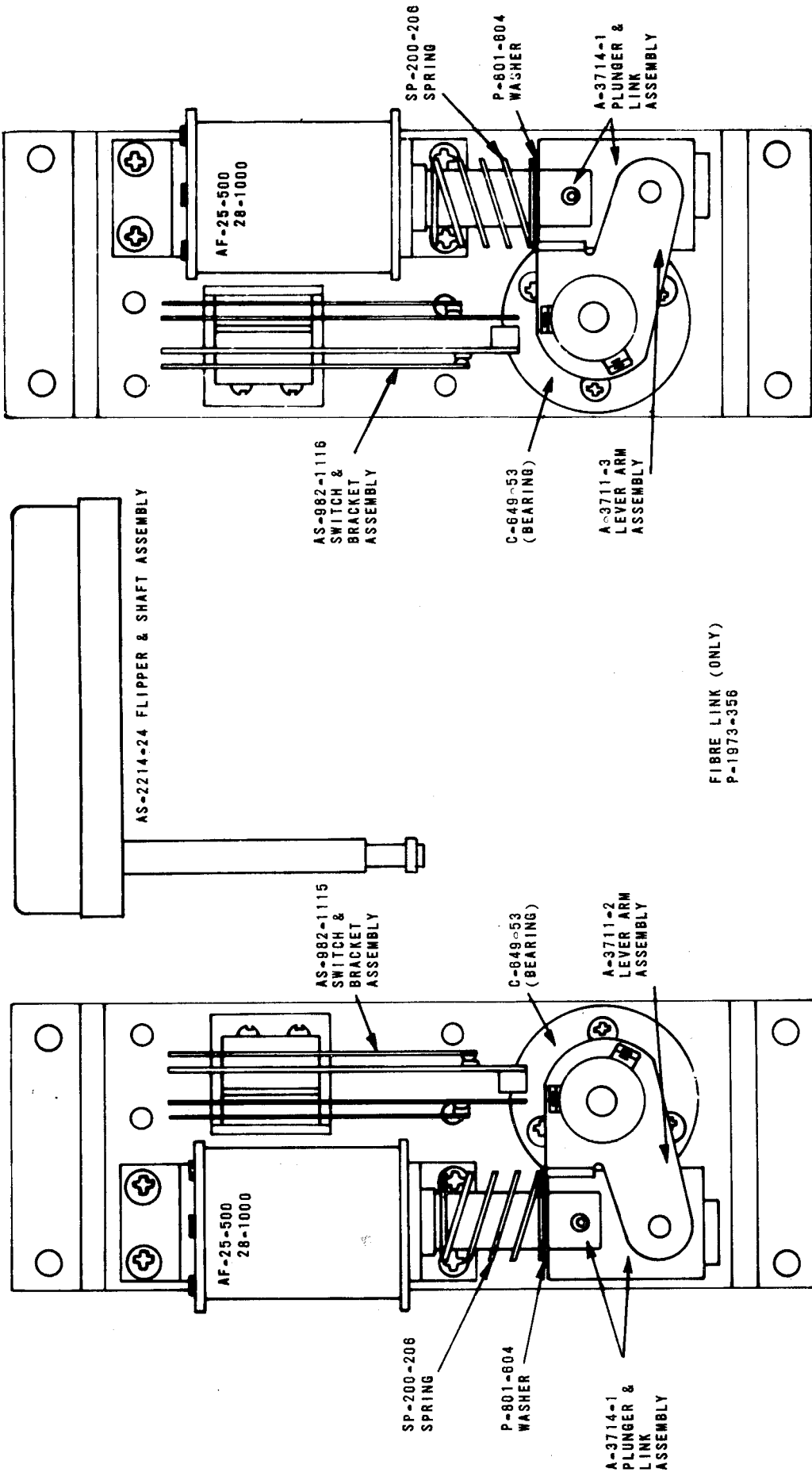
# FLIPPER UNITS (WITH SINGLE SWITCH)



AS-1587-88 FLIPPER UNIT (LEFT) (AS SHOWN)

AS-1587-89 FLIPPER UNIT (RIGHT) (AS SHOWN)

# FLIPPER UNITS (WITH DOUBLE SWITCH)



AS-1587-97 FLIPPER UNIT (RIGHT) (AS SHOWN)

AS-1587-98 FLIPPER UNIT (LEFT) (AS SHOWN)

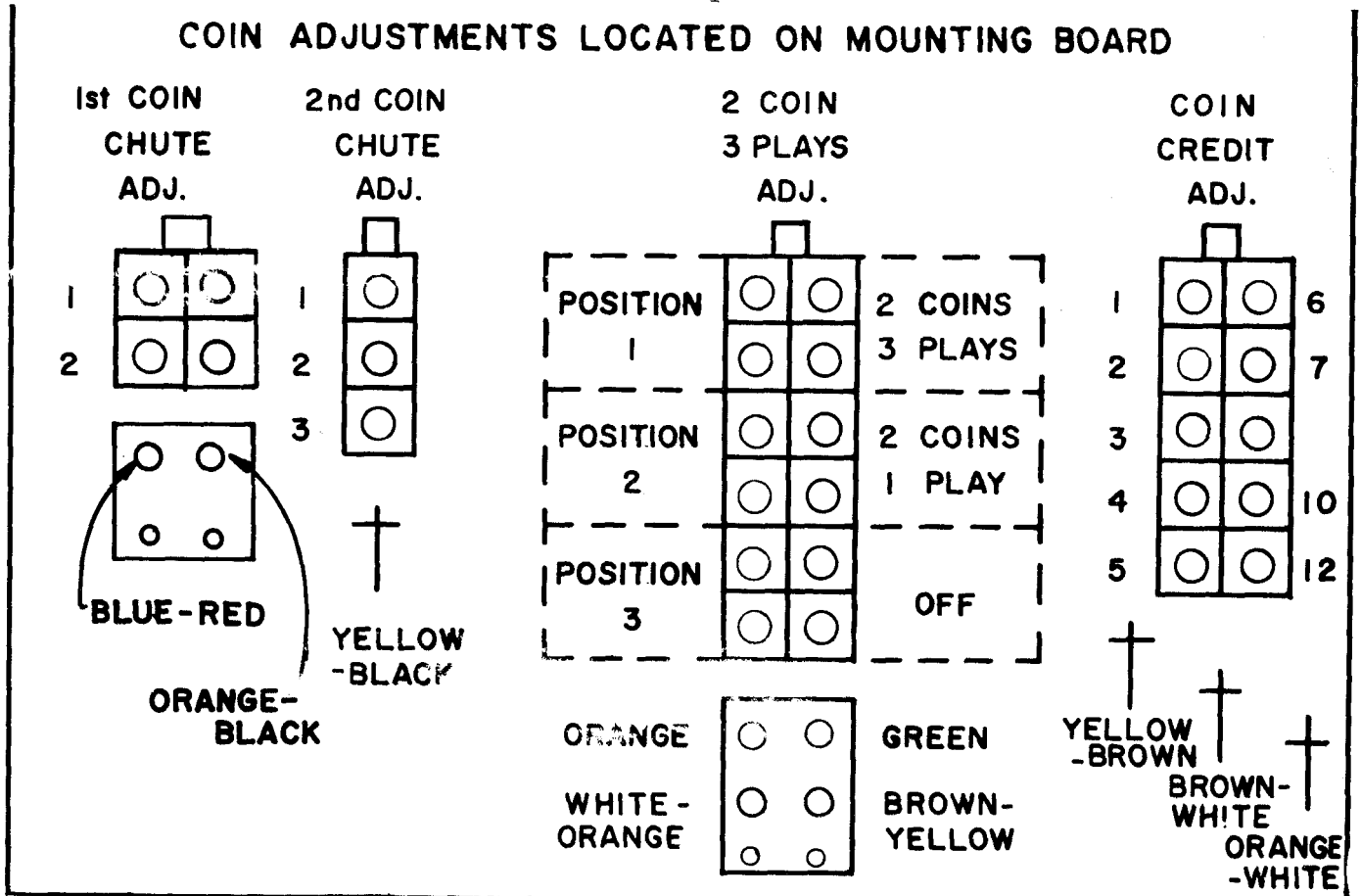
NEW COIN CREDIT ADJUSTMENTS

INTRODUCING: New simple credit adjustments in Bally's Pin Ball games which will allow flexibility in setting the number of credits desired per coin.

The function of the adjustment plugs are explained on pages 1A and 2A.

NOTE: However, to set up machine for credits desired, only follow adjustment procedures on pages 3A, 4A and 5A. A detailed layout of the adjustment sockets are also shown below for identity.

**COIN ADJUSTMENTS LOCATED ON MOUNTING BOARD**



1st COIN CHUTE ADJUSTMENT

Position 1                      2 point plug in position 1 sets up 1 play per coin.

Position 2                      2 point plug in position 2 sets up 2 credits on the credit unit.

NOTE: This adjustment is used mostly on games where 1 coin sets up 2 plays.

2nd COIN CHUTE ADJUSTMENT

Position 1                      Yellow-Black wire plug in position 1 sets up 1 player per coin.

NOTE: This adjustment is used when changing the play from 1-coin 2 or more plays to 1-coin 1-play. The coin micro switch must also have the yellow-black wire attached.

2ND COIN CHUTE ADJUSTMENT

- Position 2            Yellow-Black wire plug in position 2 sets up multiple credits per coin. The number of credits received will depend upon the location of the Brown-White wire plug in the Coin Credit Adjustment Connector. For example - to provide 6 credits per coin, place Yellow-Black plug in position 2 on the 2nd Coin Chute Connector and the Brown-White plug in position 6 on the Coin Credit Adjustment Connector.
- Position 3            Yellow-Black wire plug in position 3 is used only when 2 coins-3 plays, or 2 coins-1 play is desired. Complete adjustment procedure is on pages 3 and 5.

2 COINS - 3 PLAY ADJUSTMENT

- 1st Position            The 4 point plug in 1st position adds 1 credit for the 1st coin and 2 credits for the 2nd coin.  
2nd coin must be deposited before a ball is put into play.
- NOTE: After 2 credits are added the next coin will again repeat the above sequence,  
          That is: 1st coin - 1 credit.  
                  2nd coin - 2 credits.
- 2nd Position            The 4 point adjustment plug in 2nd position sets up 1 play for every 2 coins deposited. Complete adjustment procedure is on page 5A.
- 3rd Position            The 4 point adjustment plug should always be in position 3 when neither of the above setups are used.

---

COIN CREDIT ADJUSTMENT

RELAY REQUIRED - 2ND COIN CHUTE RELAY

- Position 1            Brown-White wire plug in position 1 adds 1 credit per coin.
- Position 2            Brown-White wire plug in position 2 adds 2 credits per coin.
- Positions 3,4,5,  
6 & 7                Brown-White wire plug in positions 3,4,5,6, & 7 will add credits corresponding to the numbered position it is inserted into.
- Positions 10,12        The 10-12 plays per coin requires additional relays. Adjustments for 10-12 plays are explained on page 5A.

ADJUSTMENT INSTRUCTIONS FOR CREDITS DESIRED

COIN	PLAYS	RELAYS REQUIRED	FRONT DOOR COIN SWITCH WIRE	PLUG ADJUSTMENTS
One	One		Door Chute SW White-Blue	Insert 2 point plug in position 1 on 1st coin chute adjustment.
Two	One	2 Coin 3 Play Relay AS-2865  3rd Coin Chute Relay AS-2865-3	Door Chute SW Yellow-Black	Insert 2 point plug in position 1 on 1st coin chute adjustment.  Yellow-Black wire plug into po- sition 3 on 2nd coin chute adj.  Orange-White wire plug into po- sition 7 on coin credit adj.  Insert 4 point plug into 2nd po- sition on 2 coins, 3 play adj.
One	Two		Door Chute SW White-Blue	Insert 2 point plug in position 2 on 1st coin chute adjustment.  Insert 4 point plug into 3rd po- sition on 2 coins, 3 plays adj.
One	Three	2nd Coin Chute Relay AS-2865-2	Door Chute SW Yellow-Black	Insert 2 point plug in position 1 on 1st coin chute adjustment.  Yellow-Black wire plug into po- sition 2 on the 2nd coin chute adjustment.  Brown-White wire plug into po- sition 3 on the coin credit adj.  Insert 4 point plug into 3rd po- sition on 2 coins, 3 plays adj.
One	Four	2nd Coin Chute Relay AS-2865-2	Door Chute SW Yellow-Black	Insert 2 point plug in position 1 on 1st coin chute adjustment.  Yellow-Black wire plug into po- sition 2 on the 2nd coin chute adj.  Brown-White wire plug into po- sition 4 on the coin credit adj.  Insert 4 point plug into 3rd po- sition on 2 coins, 3 plays adj.

COIN	PLAYS	RELAYS REQUIRED	FRONT DOOR COIN SWITCH WIRE	PLUG ADJUSTMENTS
One	Five	2nd Coin Chute Relay AS-2865-2	Door Chute SW Yellow-Black	<p>Insert 2 point plug in position 1 on 1st coin chute adjustment.</p> <p>Yellow-Black wire plug into position 2 on 2nd coin chute adj.</p> <p>Brown-White wire plug into position 5 on coin credit adj.</p> <p>Insert 4 point plug into 3rd position on 2 coins, 3 plays adj.</p>
One	Six	2nd Coin Chute Relay AS-2865-2	Door Chute SW Yellow-Black	<p>Insert 2 point plug in position 1 on 1st coin chute adjustment.</p> <p>Yellow-Black wire plug into position 2 on the 2nd coin chute adj.</p> <p>Brown-White wire plug into position 6 on the coin credit adj.</p> <p>Insert 4 point plug into 3rd position on 2 coins, 3 plays adj.</p>
One	Seven	2nd Coin Chute Relay AS-2865-2	Door Chute SW Yellow-Black	<p>Insert 2 point plug in position 1 on 1st coin chute adjustment.</p> <p>Yellow-Black wire plug into position 2 on 2nd coin chute adj.</p> <p>Brown-White wire plug into position 7 on coin credit adj.</p> <p>Insert 4 point plug into 3rd position on 2 coins, 3 plays adj.</p>

THREE COIN CHUTES

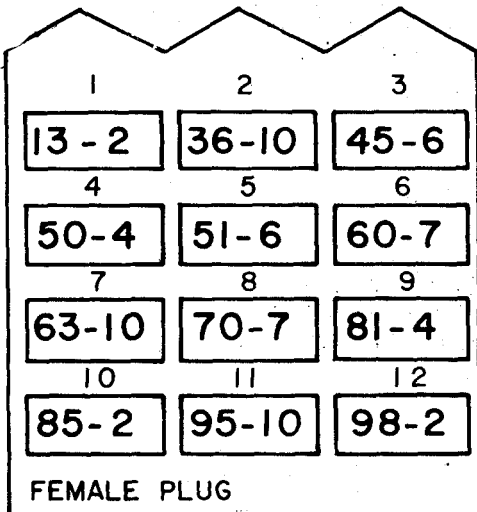
One	One		Door Chute SW White-Blue	Insert 2 point plug in position 1 on 1st coin chute adj.
One	Three	2nd Coin Chute Relay AS-2865-2	Door Chute SW Yellow-Black	<p>Yellow-Black wire plug in position 2 on 2nd coin chute adj.</p> <p>Brown-White wire plug in position 3 on coin credit adjustment.</p>
One	Seven	3rd Coin Chute Relay AS-2865-3	Door Chute SW White-Red	<p>Orange-White wire plug into position 7 on coin credit adj.</p> <p>Insert 4 point plug into 3rd position on 2 coins, 3 plays adj.</p>



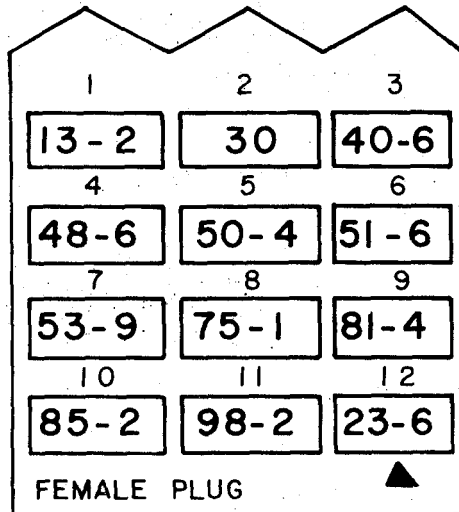
COIN	PLAYS	RELAYS REQUIRED	FRONT DOOR COIN SWITCH WIRE	PLUG ADJUSTMENTS
<u>THREE COIN CHUTES 10 or 12 PLAYS</u>				
One	Two		Door Chute SW White-Blue	Insert 2 point plug into position 2 on 1st coin chute adjustment.
One	Four	2nd Coin Chute Relay AS-2865-2	Door Chute SW Yellow-Black	Yellow-Black wire plug into position 2 on 2nd coin chute adj.
One	Ten or Twelve	3rd Coin Chute Relay AS-2865-3	Door Chute SW White-Red	Brown-White wire plug into position 4 on coin credit adj.
		10-12 Plays Relay AS-2865-1		Orange-White wire plug into position 7 on coin credit adj.
				Yellow-Brown wire plug into position 10 or 12 on coin credit adj.
				Insert 4 point plug into 3rd position on 2 coins, 3 plays adj.

2 COINS - 3 PLAYS

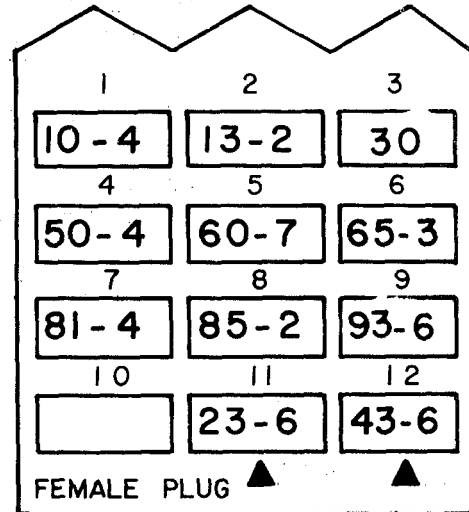
1st Coin	One			Insert 2 point plug into position 1 on 1st coin chute adjustment.
2nd Coin	Two	2nd Coin Chute Relay AS-2865-2	Door Chute SWS Yellow-Black	Yellow-Black wire plug into position 3 on 2nd coin chute adj.
		3rd Coin Chute Relay AS-2865-3		Brown-White wire plug into position 2 on coin credit adj.
		2 Coins 3 Play Relay AS-2865		Orange-White wire plug into position 7 on coin credit adj.
				Insert 4 point plug into 1st position on 2 coins, 3 play adj.



2 COIN 3 PLAY OR  
10-12 PLAY



3RD COIN CHUTE



2ND COIN CHUTE

▲ PROTO-TYPE GAMES ONLY

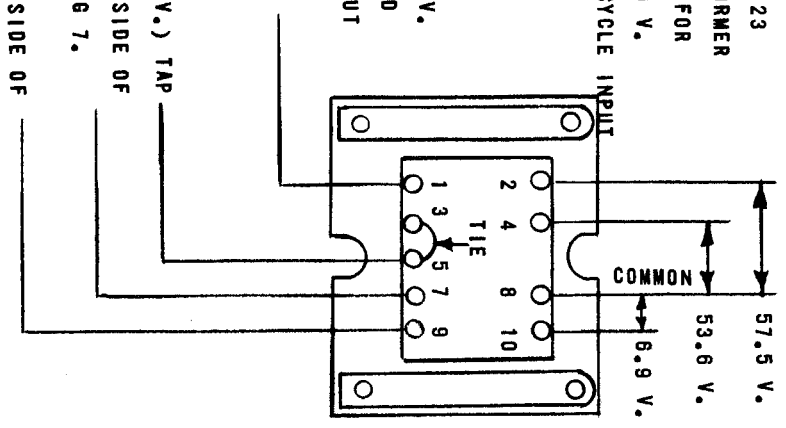
**IMPORTANT**

THESE SPECIALLY TAPPED TRANSFORMERS PROVIDE FOR LOCATIONS WITH LOW LINE VOLTAGE. MOVING THE 15 (RED-WHITE) WIRE FROM THE LOW TAP (LUG 4) TO THE HIGH TAP (LUG 2) WILL ALLOW GAME TO OPERATE AT A LOW LINE VOLTAGE.

**CAUTION**

AT NO TIME SHOULD THE 15 (RED-WHITE) WIRE BE LEFT ON THE HIGH TAP WHEN LOCATION VOLTAGE EQUALS OR EXCEEDS 110/220 VOLTS.

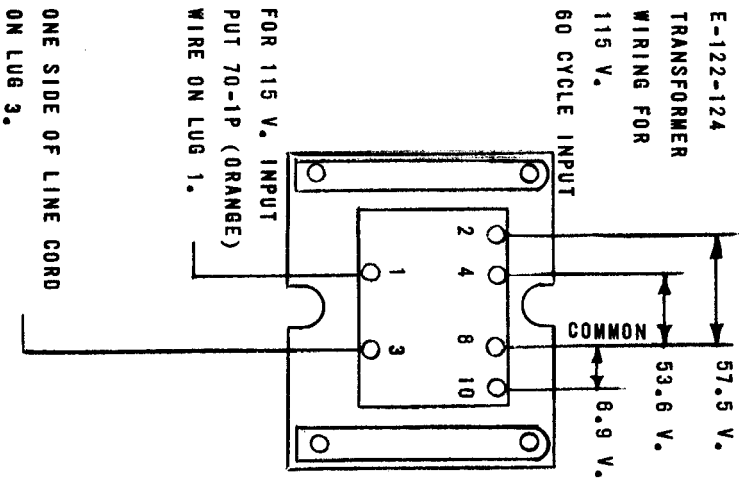
E-122-123  
TRANSFORMER  
WIRING FOR  
220/240 V.  
50/60 CYCLE INPUT



FOR 220 V. OR 240 V.  
INPUT TIE LUG 3 AND  
LUG 5 TOGETHER. PUT  
70-1 (ORANGE) WIRE  
ON LUG 1.

LUG 5 (115 V.) TAP  
FOR 240 V. ONE SIDE OF  
LINE CORD ON LUG 7.  
FOR 220 V. ONE SIDE OF  
LINE CORD ON LUG 9.

E-122-124  
TRANSFORMER  
WIRING FOR  
115 V.  
60 CYCLE INPUT



FOR 115 V. INPUT  
PUT 70-1P (ORANGE)  
WIRE ON LUG 1.

ONE SIDE OF LINE CORD  
ON LUG 3.

**NEW TYPE TRANSFORMER**

## TIME DELAY CIRCUIT

The purpose of the time delay circuit is to prevent unnecessary abuse of the machine it is installed in. The time delay relay is energized anytime one of the slam switches are made to contact. There are three factory installed slam switches, one on the front door, one on the mechanism mounting board and one on the cabinet. (Any number of slam switches could be installed by the operator, to meet his individual requirement.) The switches should be adjusted to have approximately 1/16" gap between the contacts. The weighted blade should be adjusted to attain the desired sensitivity. Decreasing the gap between contacts will make switch more sensitive. Opening the gap will reduce sensitivity. The total time the delay relay is energized can be varied by changing the #455 bulb mounted on the delay relay frame. If unable to get a short enough time of delay, get a Westinghouse #455 bulb; these units are considerably faster. If still unable to bring the time down, check the location voltage. It should not be under 49.5 V.A.C. on the transformer secondary.