

# Bally®

# MISS AMERICA

## OPERATING INSTRUCTIONS AND PARTS CATALOG

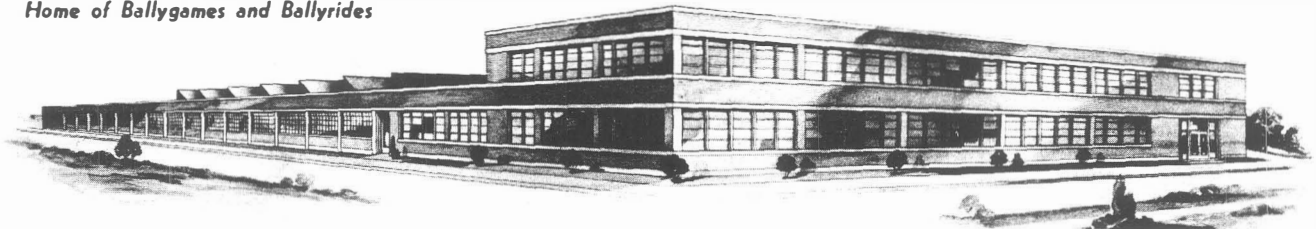
Part Numbers are marked on illustrations  
and a list of miscellaneous parts appears  
on back cover.

**FOR QUICKEST SERVICE  
STATE CORRECT PART NUMBER  
WHEN ORDERING PARTS**

### CODE

N.C.-----NORMALLY CLOSED  
N.O.-----NORMALLY OPEN  
M.B.B.-----MAKE BEFORE BREAK  
S.P.D.T.----SINGLE POLE DOUBLE THROW

*Home of Ballygames and Ballyrides*



Thru wipers (A), circuits to flash "Select Now" lite at 4th step of unit. (Diag. K-1)

Thru wiper (B), circuit to step this unit for 1st 4 steps. (Diag. H-7)

Feed for wipers (B) & (C)  
Thru wiper (C), circuit to close shutter at 2nd step of unit. (Diag. H-8)

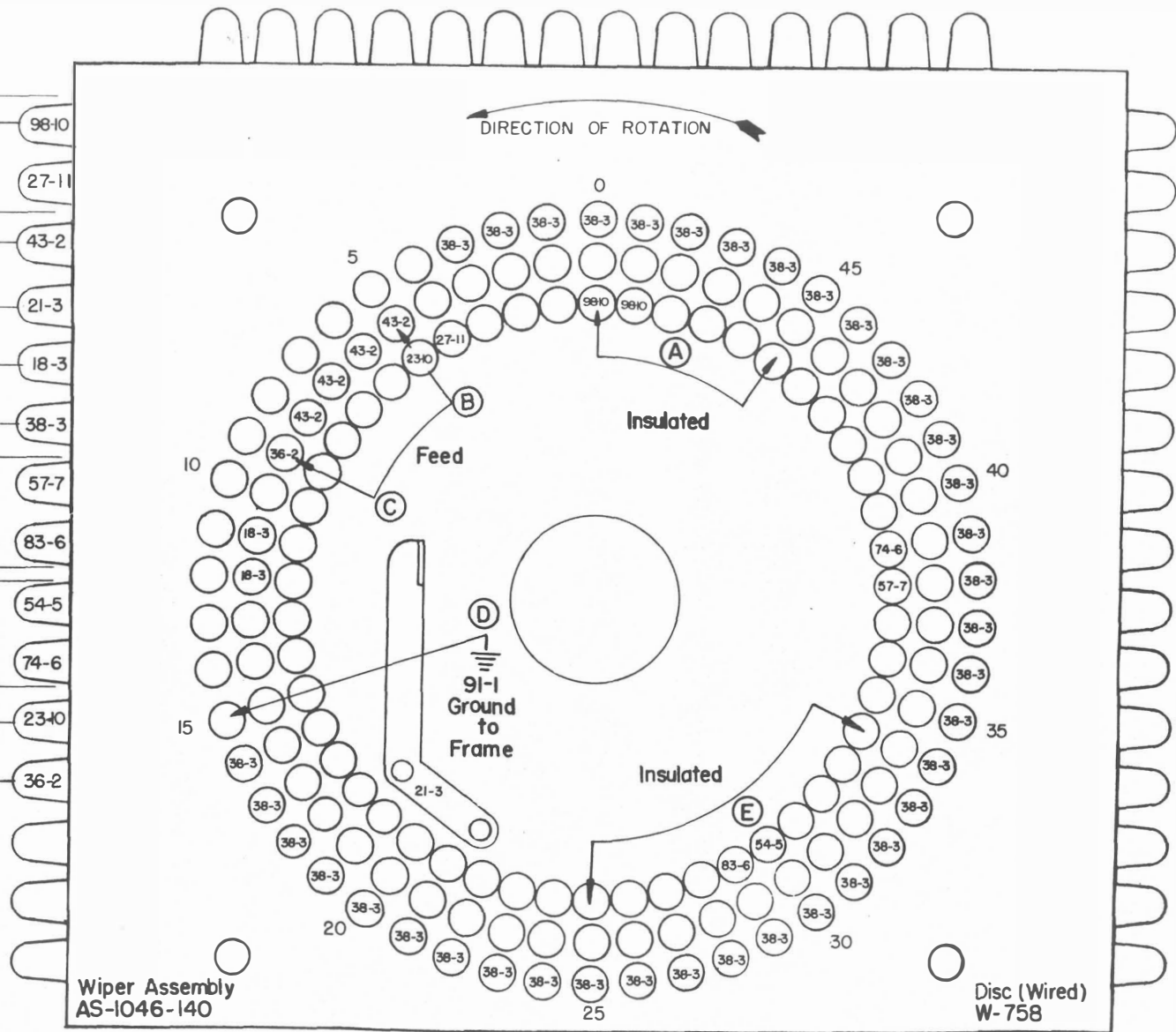
Thru wiper (D), ball lifter circuit after 1st ball is raised (Diag. E-12)

Thru wipers (E), circuit to energize before 4th selector lock trip relay, when 4th ball is shot (Diag. B-9)

Thru wipers (E), circuit to energize before 5th selector lock trip relay when 5th ball is shot. (Diag. B-9)

Thru wipers (A), circuit to flash "Select Now" lite at 5th step of unit (Diag. K-1)

Thru wiper (B), circuit to step unit from 4th to 5th, when 4th ball is shot. (Diag. H-8)



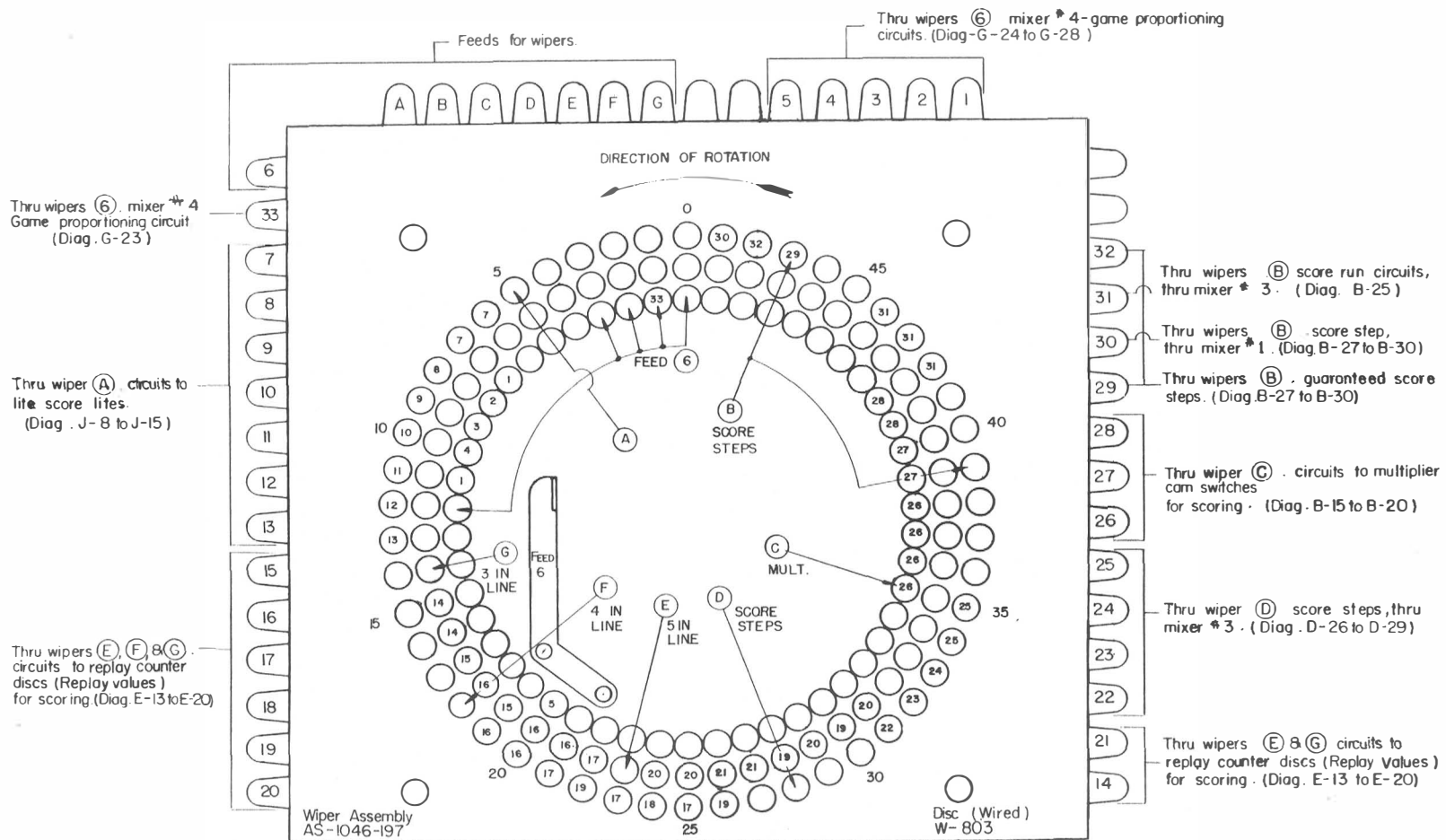
Complete Unit - AS-110-23  
 Reset Coil - 28-R-15  
 Step-Up Coil - 25-GG-7  
 Step-Up Plunger - S-496-100  
 Step-Up Arm - A-1765  
 Ratchet & Shaft - C-1050-39-21

# SCORE UNITS viewed from BUTTON or WIPER side

8 step unit. Wipers shown in zero or reset position

(4 used — see box below)

LUG	RED SCORE UNIT	YELLOW SCORE UNIT	GREEN SCORE UNIT	WHITE SCORE UNIT
1	15-8	48-8	78-8	21
2	10-8	43-8	65-8	60
3	90-7	21-8	57-8	63
4	13-7	13-8	56-8	65-9
5	71-9	74-9	15-10	75-9
6	23-4	23-4	23-4	23-4
7	81-5	60-5	15-1	51-7
8	83-5	61-5	20-1	54-7
9	93-5	63-5	21-2	71-7
10	13-6	65-5	23-1	74-7
11	15-9	71-5	25-2	81-7
12	38-6	74-5	27-3	83-7
13	40-6	78-5	30-1	20-8
14	60-2	78-1	41-3	10-6
15	74-2	81-1	43-3	25-6
16	83-2	93-1	48-3	31-6
17	85-2	23-2	60-3	50-6
18	10-3	40-2	63-3	52-6
19	20-3	41-2	65-3	53-6
20	23-3	51-2	74-3	54-6
21	71	23	91	61-6
22	45-9	45-9	45-9	45-9
23	27-5	27-5	27-5	27-5
24	38-5	38-5	38-5	38-5
25	40-5	40-5	40-5	40-5
26	43-4	43-4	43-4	43-4
27	52	52	52	52
28	57	57	57	57
29	60-6	60-6	60-6	60-6
30	63-9	63-9	63-9	63-9
31	56-10	54-10	61-10	5-10
A	30	30	30	30
B	83-4	75-8	90-4	21-9
C	85	41	14-2	43-7
D	65-4	52-4	74-4	91-9
E	61-3	61-3	61-3	61-3
F	93-8	83-8	18-9	57-5
G	81-8	54-3	63-8	10-5
32	10-7	10-7	10-7	10-7
33			51-10	



- Complete unit (Red) AS-1022-35
- Complete unit (Yellow-Green-White) AS-1022-36
- Reset coil - 28-R-15
- Step-up coil - 25-GG-7
- Step-up plunger - S-496-100
- Step-up arm - A-1765-3
- Ratchet & Shaft - C-1050-8-39

**EXTRA BALL UNIT** viewed from **BUTTON** or **WIPER** side

10 step unit. Wipers shown in zero or reset position

Extra ball runs. Thru wipers (C) & (E) (Diag. C - 22)

Extra ball lites. Thru wipers (A) & (B) (Diag. J - 18)

Feeds wipers (A) & (B) for lite circuits (Diag. J - 18)

Feeds wipers (C) & (E) for extra ball runs (Diag. C-22)

Feeds wipers (F), (G) & (H) for single steps. (Diag. C-23)

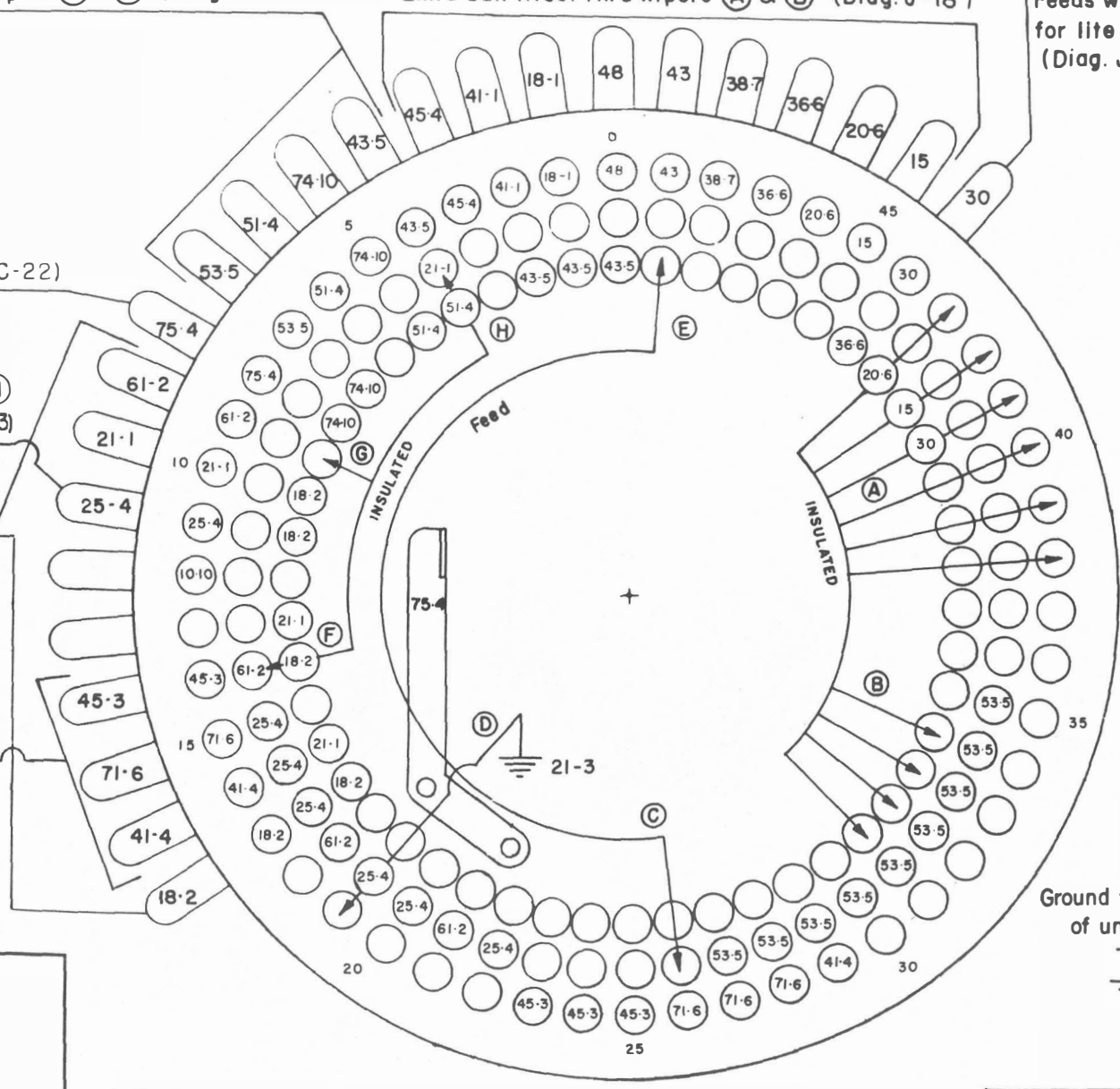
Single steps thru wipers (F), (G) & (H) (Diag. C - 23)

Extra ball count circuit to ball trough switches No. 3, No. 2 & No. 1 Thru wiper (D) (Diag. H-12)

- Complete Unit - AS-1148-14
- Reset Coil - 28-R-15
- Step-up Coil - 25-GG-7
- Step-up Plunger - S-496-100
- Step-up Arm - A-1765
- Ratchet & Shaft - C-1050-10

**WIPER ASSEMBLY**  
AS-1046-142

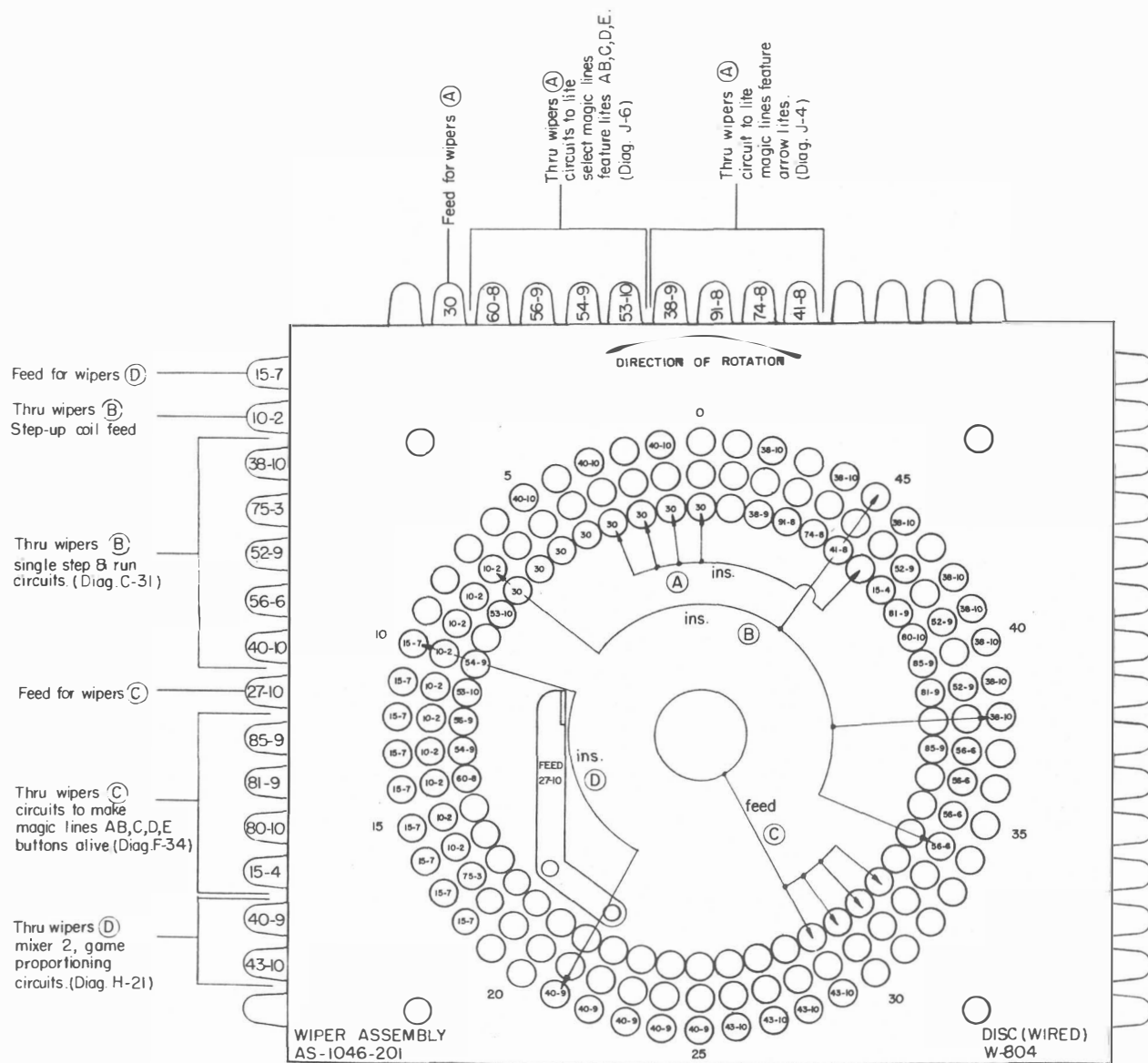
**DISC (WIRED)**  
W-668



Direction of rotation

# SELECTION FEATURE UNIT viewed from BUTTON or WIPER side

11 step unit. Wipers shown in zero or reset position



- COMPLETE UNIT - AS-827-57
- RESET COIL - 28-R-15
- STEP-UP COIL - 25-GG-7
- STEP-UP PLUNGER - S-496-100
- STEP-UP ARM - A-1765-3
- RATCHET & SHAFT - C-1050-11-44

# MAGIC LINES UNIT PARTS LIST

Complete Unit — AS-1714

Base Plate — A-2101

Contact Strips for

A. Line — A-2097

B. Line — A-2097-1

C. Line — A-2097-2

D. Line — A-2097-3

E. Line — A-2097-4

Plastic Number Display Strips for

A. Line — A-2099

B. Line — A-2099-1

C. Line — A-2099-2

D. Line — A-2099-3

E. Line — A-2099-4

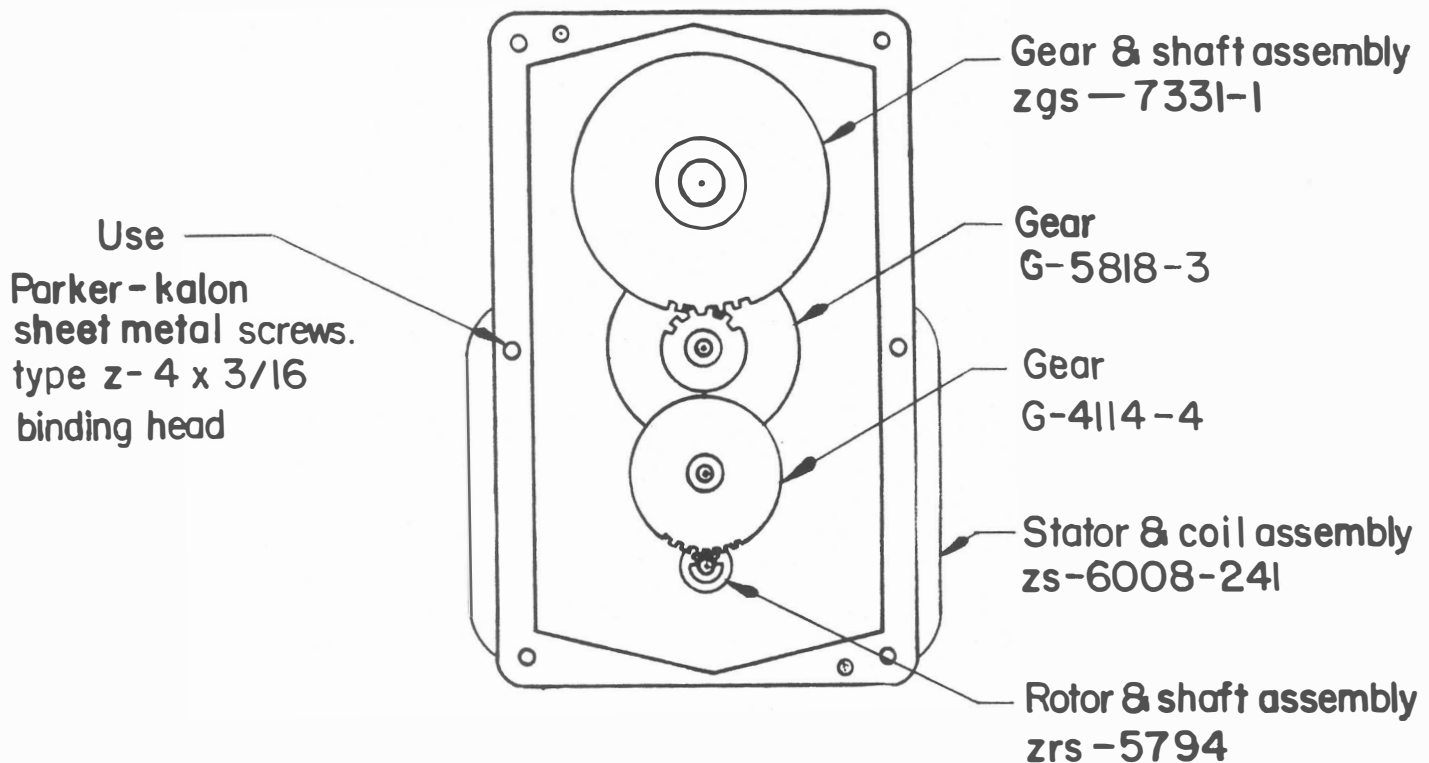
Gear — P-362-7

Gear Assembly — A-1823-5

Fan for Motor — A-1605-2

Motor — E-119-147

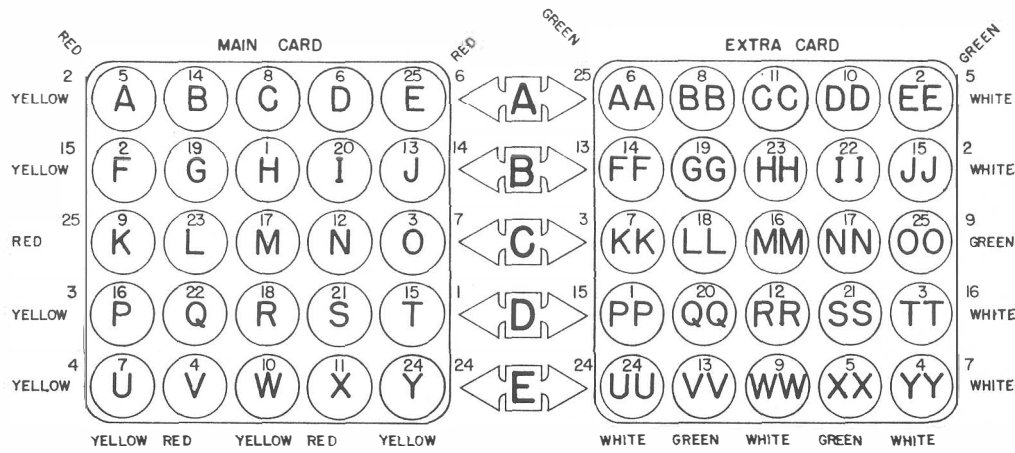
## MAGIC-LINES UNIT MOTOR (PART NO. E-119-147)



### NOTE :

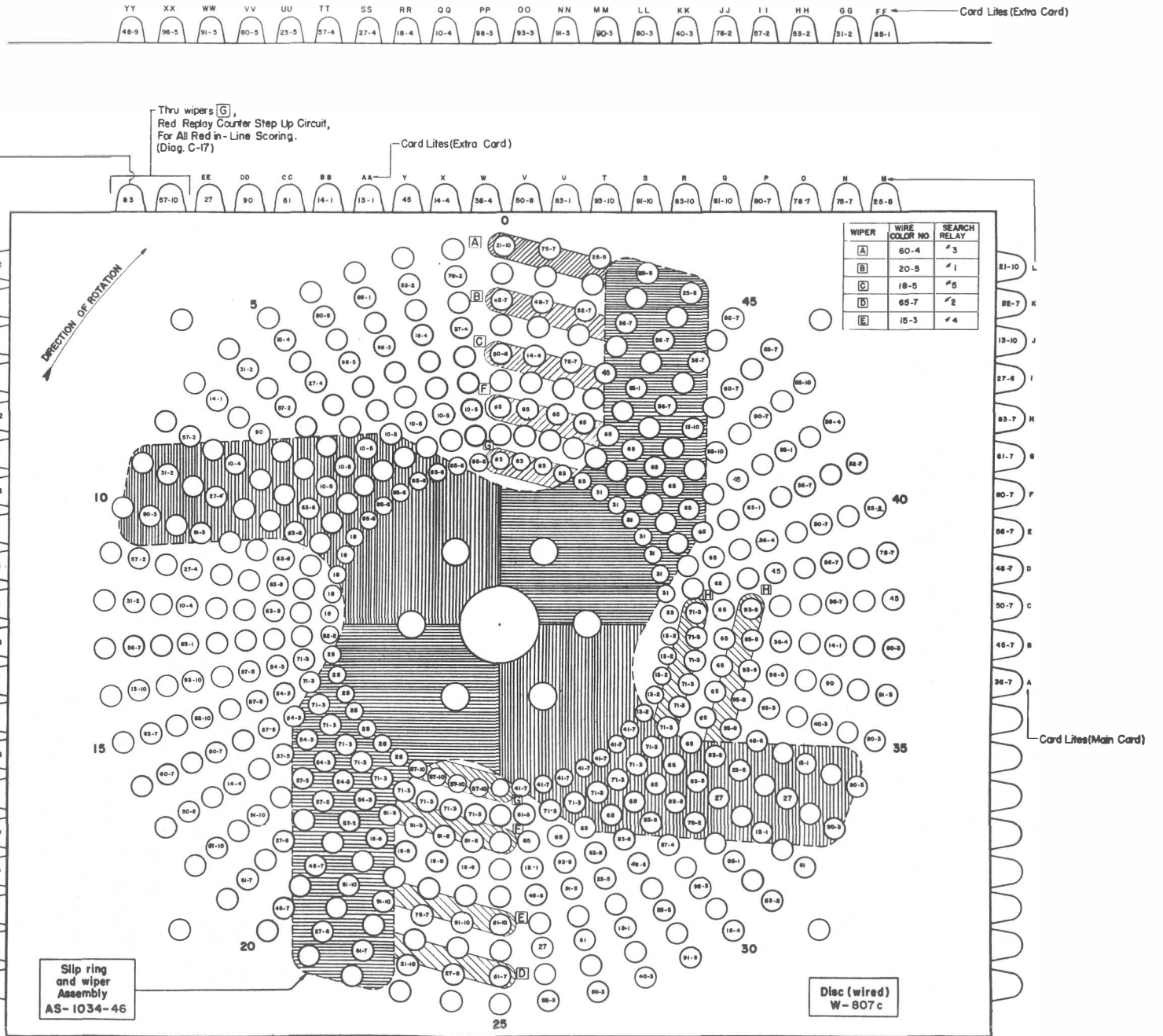
When ordering gears for magic lines unit motor, refer to part numbers shown above.

Card layouts (Neutral Position).  
 Magic lines shift horizontally left or right.



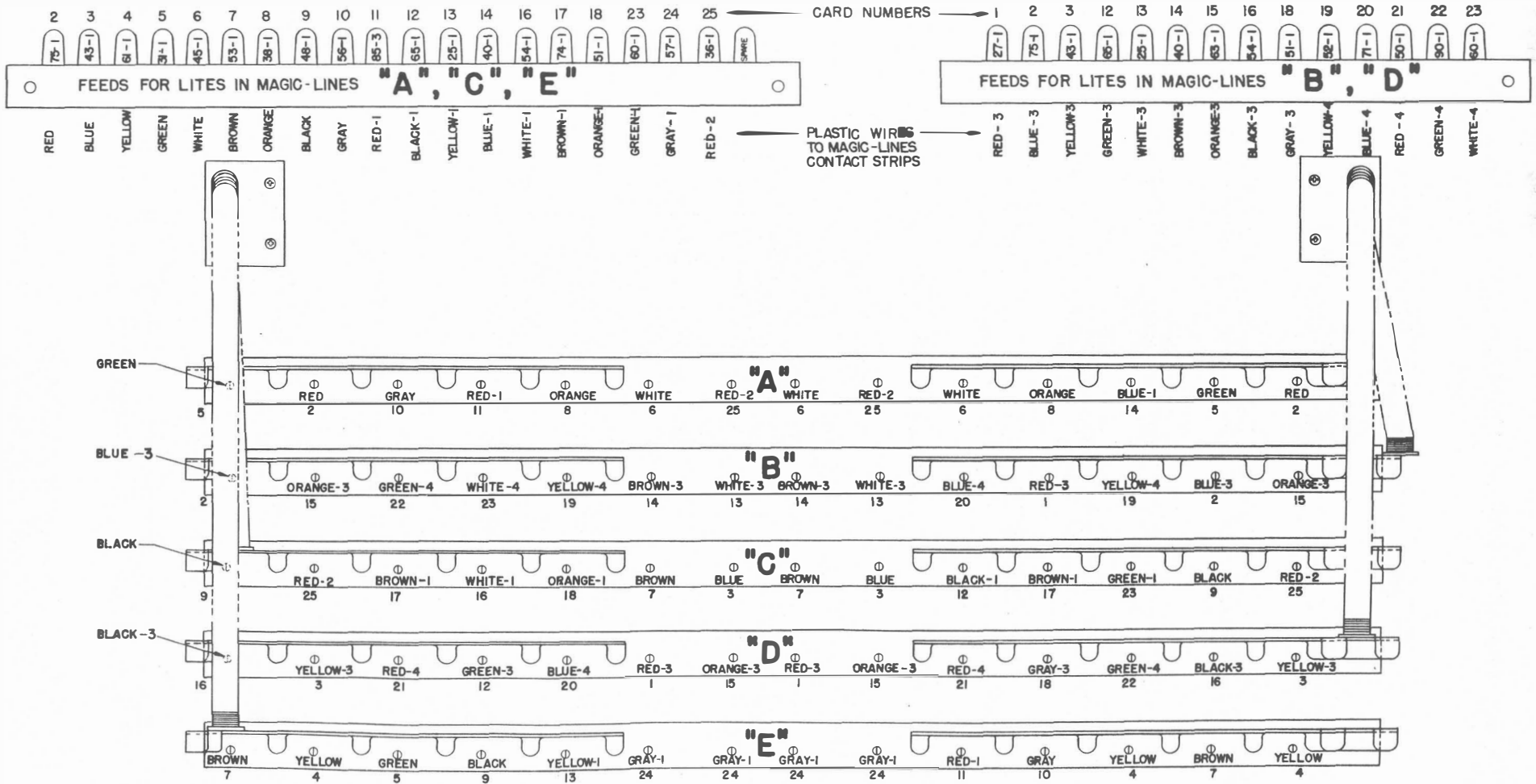
SEARCH POSITIONS						
WIPER AT POSITION	WIPER B ROW 7 SEARCH RELAY #1	WIPER D ROW 8 SEARCH RELAY #2	WIPER A ROW 9 SEARCH RELAY #3	WIPER E ROW 6 SEARCH RELAY #4	WIPER C ROW 5 SEARCH RELAY #5	
1						
2						
3						
4						
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22						
23						
24						
25						
26	EE	JJ	OO	TT	YY	WHITE
27	CC	HH	MM	RR	WW	
28	AA	FF	KK	PP	UU	
29	UU	VV	WW	XX	YY	GREEN
30	PP	QQ	RR	SS	TT	
31	FF	GG	HH	II	JJ	
32	AA	BB	CC	DD	EE	RED
33	EE	II	MM	QQ	UU	
34	AA	GG	MM	SS	YY	
35	KK	LL	MM	NN	OO	YELLOW
36	DD	II	NN	SS	XX	
37	BB	GG	LL	QQ	VV	
38	A	E	Y	U		RED
39	E	J	O	T	Y	
40	C	H	M	R	W	
41	A	F	K	P	U	YELLOW
42	U	V	W	X	Y	
43	P	Q	R	S	T	
44	F	G	H	I	J	RED
45	A	B	C	D	E	
46	E	I	M	Q	U	
47	A	G	M	S	Y	RED
48	K	L	M	N	O	
49	D	I	N	S	X	
50	B	G	L	Q	V	

NOTATION OF SEARCH DISC WIPERS FROM 50 TO 1





# REAR VIEW OF WIRING OF MAGIC LINES UNIT

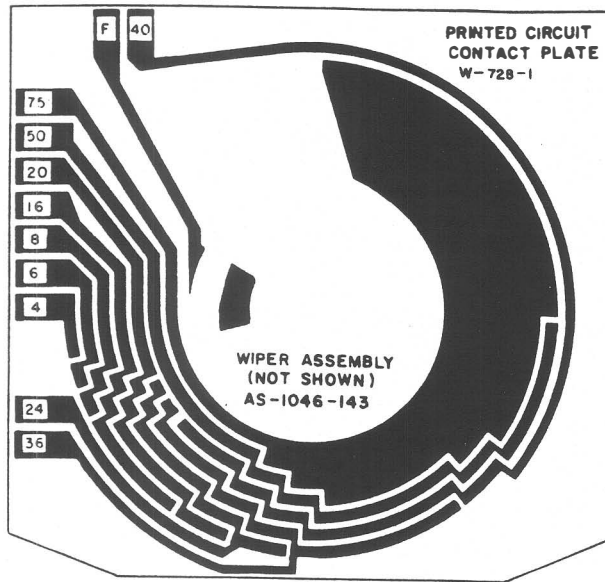


# REPLAY COUNTER

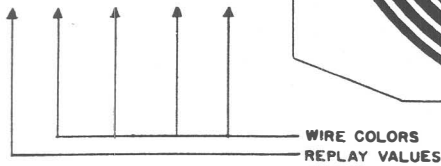
viewed from WIPER side

3 used (see code box at left)

LUG	RED	YELLOW	GREEN	WHITE
50	20-3	41-2	65-3	53-6
75	23-3	51-2	74-3	54-6
F	71	23	91	61-6
36	10-3	40-2	63-3	52-6
24	85-2	23-2	60-3	50-6
20				
16	83-2	93-1	48-3	31-6
8	74-2	81-1	43-3	25-6
6				
4	60-2	78-1	41-3	10-6
40				



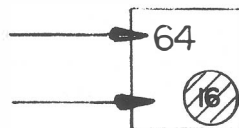
- Complete Unit - AS-797-39
- Reset Coil - 28-R-15
- Step-up Coil - 25-GG-7
- Step-up Plunger - S-496-116
- Step-up Arm - A-1765
- Ratchet & Shaft - C-100



CAM SWITCHES THAT PULSE YELLOW, GREEN, RED, & WHITE REPLAY COUNTER STEP-UP COILS							
	sw.12A	sw.12 A	sw.12 A	sw.11 A	sw.11 A	sw.10 A	sw.10A
5 IN LINE	75 	96 	96 	200 	300 	400 	600 
4 IN LINE	16 	24 	50 	96 	144 	192 	400 
3 IN LINE	4 	8 	16 	32 	64 	128 	192 

LARGE NUMBERS ARE REPLAY SCORES SHOWN ON BACK GLASS  
 NUMBERS IN SHADED CIRCLES INDICATE WHICH PORTION OF  
 REPLAY CIRCUIT STRIP  
 IS EFFECTIVE FOR A PARTICULAR REPLAY SCORE.

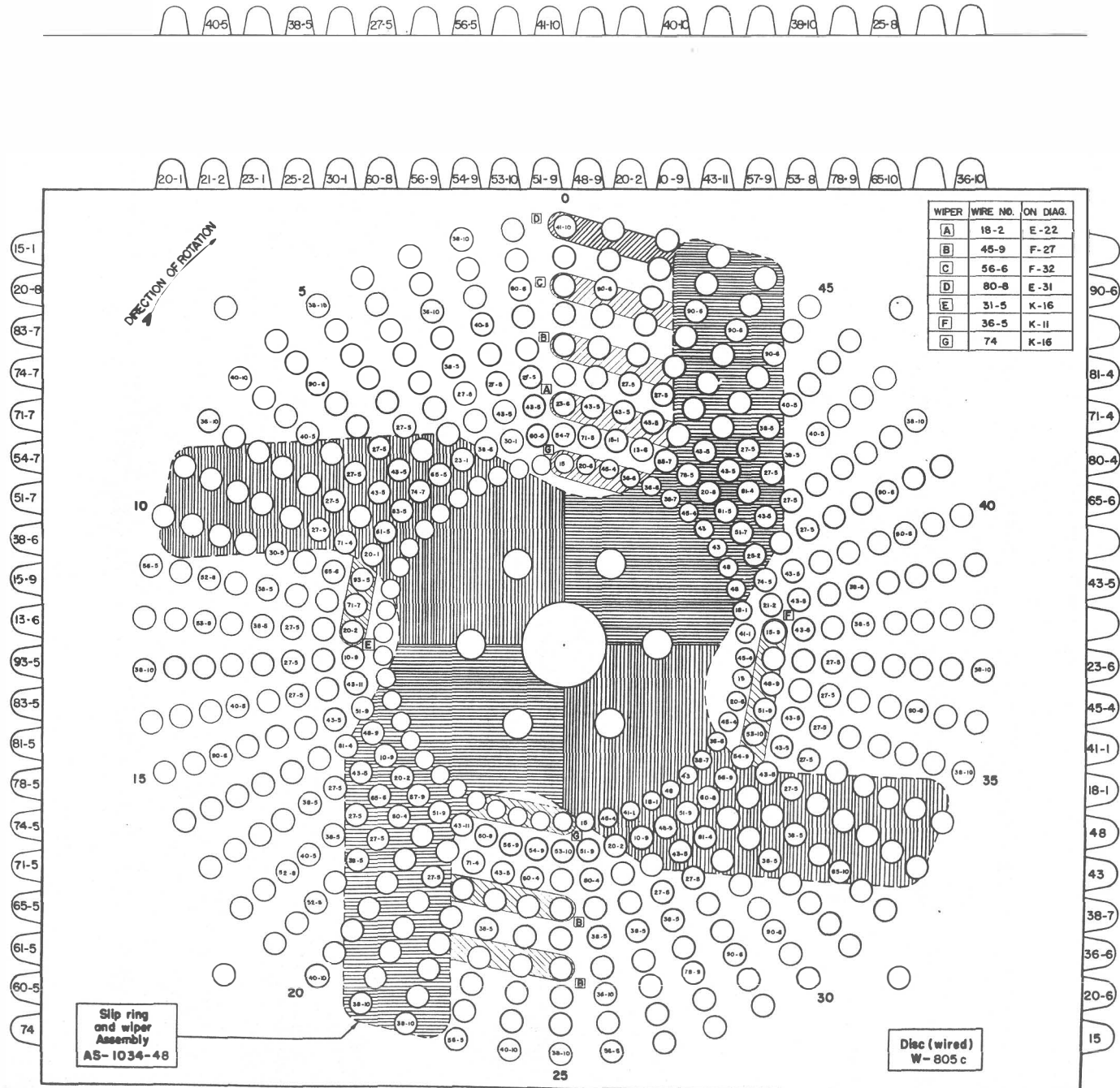
EXAMPLE: ON A 3-IN-LINE SCORE OF  
 THE CIRCUIT IS EFFECTIVE THRU THE



REPLAYS  
 REPLAY CIRCUIT STRIP

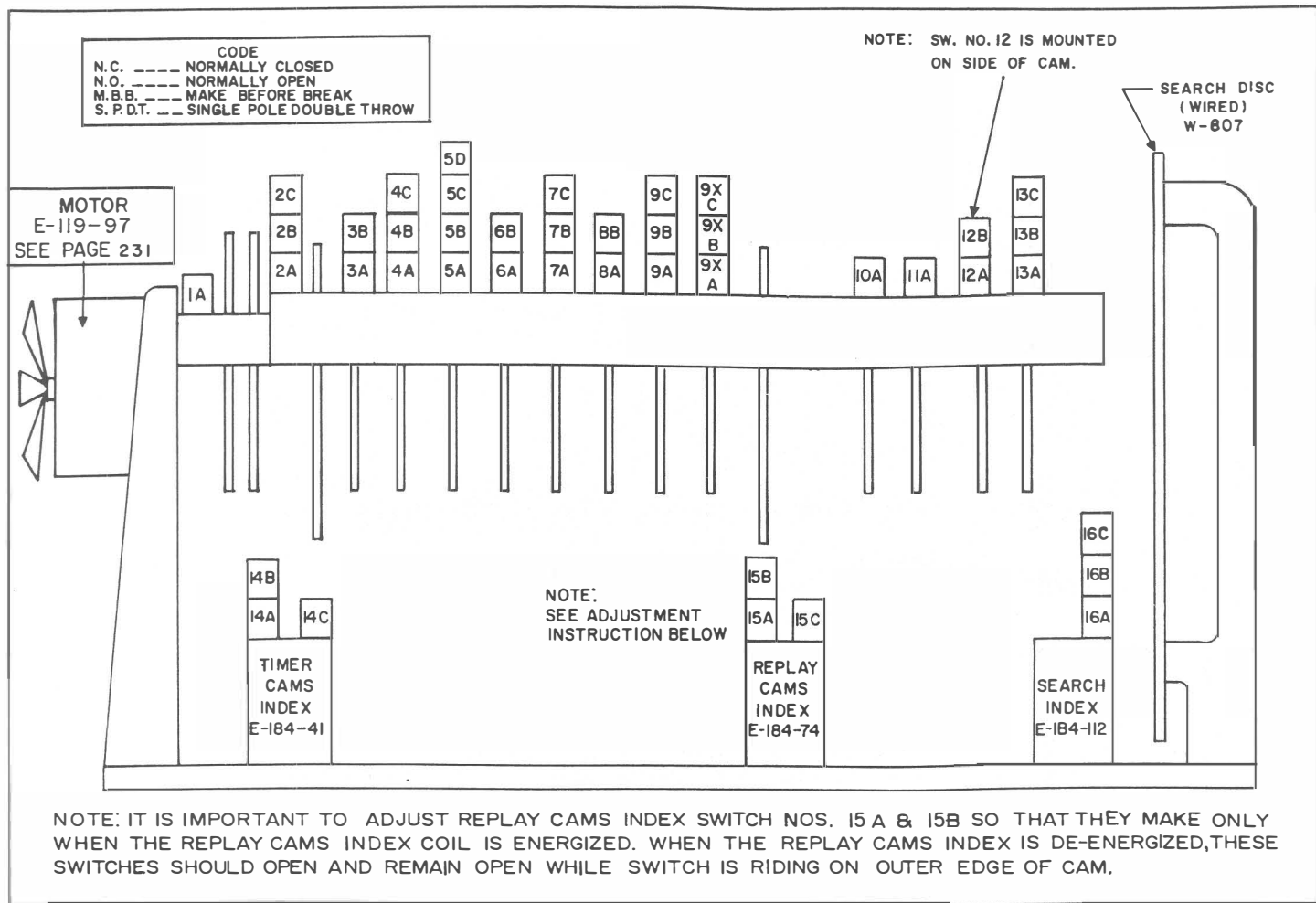
NOTE: 96 VALUE REPLAY SCORES ARE EFFECTIVE THRU THE OPEN AT 96 SWITCH.

# SPOTTING DISC viewed from BUTTON or WIPER side



# CONTROL UNIT PICTORIAL VIEW

NUMBERS CORRESPOND TO SWITCH CHART

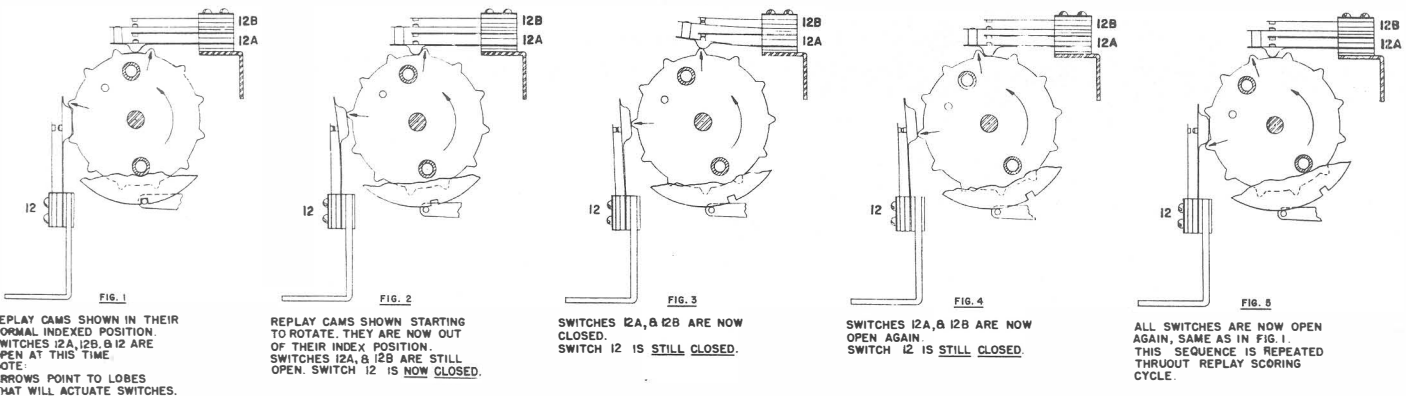


NOTE: IT IS IMPORTANT TO ADJUST REPLAY CAMS INDEX SWITCH NOS. 15 A & 15B SO THAT THEY MAKE ONLY WHEN THE REPLAY CAMS INDEX COIL IS ENERGIZED. WHEN THE REPLAY CAMS INDEX IS DE-ENERGIZED, THESE SWITCHES SHOULD OPEN AND REMAIN OPEN WHILE SWITCH IS RIDING ON OUTER EDGE OF CAM.

## CHART ON NEXT PAGE

### CORRECT ADJUSTMENT: CONTROL UNIT CAM SWITCHES 12, 12A & 12B

**NOTICE:** IMPORTANT PART OF ILLUSTRATION IS TO SHOW THAT SWITCH 12 CLOSSES FIRST AND OPENS LAST. IF AN ADJUSTMENT IS NECESSARY, SWITCH 12 CAN BE MOVED UP OR DOWN. LOOSEN SCREWS THAT HOLD SWITCH, THEN MOVE UP OR DOWN.



REPLAY CAMS SHOWN IN THEIR NORMAL INDEXED POSITION. SWITCHES 12A, 12B, & 12 ARE OPEN AT THIS TIME. NOTE: ARROWS POINT TO LOBES THAT WILL ACTUATE SWITCHES.

REPLAY CAMS SHOWN STARTING TO ROTATE. THEY ARE NOW OUT OF THEIR INDEX POSITION. SWITCHES 12A, & 12B ARE STILL OPEN. SWITCH 12 IS NOW CLOSED.

SWITCHES 12A, & 12B ARE NOW CLOSED. SWITCH 12 IS STILL CLOSED.

SWITCHES 12A, & 12B ARE NOW OPEN AGAIN. SWITCH 12 IS STILL CLOSED.

ALL SWITCHES ARE NOW OPEN AGAIN, SAME AS IN FIG. 1. THIS SEQUENCE IS REPEATED THROUGHT REPLAY SCORING CYCLE.

# CONTROL UNIT CAM SWITCH CHART

FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW

CAM SWITCH		LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
1A	N. O.	F-8	65-2 36-9	Brown-White Yellow-Brown	Circuit to step timer unit, after 5th ball is shot.
2A	N. O.	I-3	90-5 30	Gray Yellow	Energizes reflex play magnet, and replay register reset. Also pulses total plays meter.
2B	N. O.	C-37	93-4 30	Gray-Yellow Yellow	Energizes coin kicker magnet.
2C	N. C.	E-9	31-7 57-6	Yellow-Red White-Orange	Drops out red button relay.
3A	N. C.	I-4	83-3 48-2	Black-Yellow Green-Black	Drops out start relay and sets as safety switch during spin.
3B	S. P. D. T.	B-14	93-7 98-4 91-7	Gray-Yellow Gray-Black Gray-Red	Directs circuit to replay meter or total plays meter.
4A	N. O.	C-39	98-1 30	Gray-Black Yellow	Energizes spotting cams index coil.
4B	N. O.	C-5	14-9 80-2	Red-Green Black	Used if coin meter is added in front cabinet.
4C	N. O.	D-23	78-4 91-11	Orange-Black Grey-Red	Energizes anti-cheat relay.
5A	N. O.	G-8	65-2 71-8	Brown-White Orange-Red	Energizes timer reset coil.
5B	N. O.	B-22	38-4 21-1	Yellow-Black Blue-Red	Energizes extra ball unit step-up coil. Steps unit from minus one position to zero position.
5C	N. O.	D-30	52-9 85-4	White-Blue Black-White	"Selection feature" steps.
5D	N. O.	E-25	10-7 85-4	Red Black-White	Score unit steps.
6A	N. C.	I-23	51-5 75-5	White-Red Orange-White	Opens game advantage circuits during spin.
6B	N. O.	C-39	25-9 30	Blue-White Yellow	Energizes score extra step index coil.
7A	N. O.	E-23	60-6 85-4	Brown Black-White	Guaranteed step circuit for Yellow, Red, Green and White score units.
7B	N. O.	F-25	45-9 63-4	Green-White Brown-Yellow	Score unit steps.
7C	N. O.	C-37	93-4 30	Gray-Yellow Yellow	Safety switch for coin kicker magnet.
8A	N. O.	G-29	14-8 56-6	Red-Green White-Brown	Energizes "extra card" trip relay, "rollover" trip relay, "corners" trip relay and select before 5th ball trip relay, when circuit complete thru other factors. Also "selection feature" single steps.
8B	N. O.	B-23	25-4 38-4	Blue-White Yellow-Black	Extra ball unit steps.

CONTINUED ON NEXT PAGE

# CONTROL UNIT CAM SWITCH CHART — CONTINUED

CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
9A Alt.	D-22	43-5 74-10	Green-Yellow Orange-Green	Proportioning circuit. (Extra ball steps)
9B Alt.	C-31	10-2 75-3	Red Orange-White	Proportioning circuit. ("Selection Feature" steps.)
9C Alt.	C-32	14-11 53-8	Red-Green White-Yellow	Proportioning circuit. ("Corners" feature.)
9XA Alt.	H-22	15-7 54-8	Red-White White-Green	Proportioning circuit. (Scores & extra ball steps)
9XB Alt.	G-33	25-10 60-10 61-9	Blue-White Brown Brown-Red	Circuit to make the yellow or red panel rollover hot, for energizing select before 5th.
9XC Alt.	L-3	20-2 45-5 10-9	Blue Green-White Red	Circuit to lite yellow or red "rollover" feature lites.
10A N.O.	A-16	57 70	White-Orange Orange	Pulses replay counters when 3-in-line replay scores are 128 or 192.
11A N.O.	A-16	52 70	White-Blue Orange	Pulses replay counters when 3-in-line replay scores are 32 or 64.
12A N.O.	A-15	43-4 70	Green-Yellow Orange	Pulses replay counters when 3-in-line replay scores are 4, 8 or 16.
12B N.O.	C-13	48-4 80	Green-Black Black	Pulses replay register step-up coil, and reflex replay magnet.
12 N.O.	H-13	21-3 14	Blue-Red Red-Green	Replay lock-in switch. NOTE: See control unit pictorial view.
13A N.C.	I-14	56 93	White-Brown Gray-Yellow	Prevents the start of another replay scoring, when unit cams are indexed.
13B N.C.	C-8	27-2 90-2	Blue-Orange Gray	Opens circuit to timer step-up coil, during replay winner.
13C N.O.	F-1	20-1P 60-P	Blue (Plastic) Brown (Plastic)	(Safety circuit) magic-lines motor.
TIMER CAMS INDEX COIL	B-6	15-5 93-2	Red-White Gray-Yellow	Energized by switch on start relay. Also thru shutter motor cam switch #5C.
14A N.O.	G-1	20-P 60-P	Blue (Plastic) Brown (Plastic)	Operates control unit, mixer and spotting unit motors during spin.
14B N.C.	G-5	14-9 71-2	Red-Green Orange-Red	Opens circuit to coin lockout magnet during spin.
14C N.C.	D-10	13 30	Red-Yellow Yellow	Lock in safety switch for red button relay.
REPLAY CAMS INDEX COIL	A-13	40-4 70	Green Orange	Energizes when winning score is made and releases replay cams.
15A N.O.	D-13	14 80	Red-Green Black	In series with replay lock in circuit. NOTE: See control unit pictorial view for correct adj.
15B N.O.	I-14	56 93	White-Brown Gray-Yellow	In series with replay winner circuit. NOTE: See control unit pictorial view for correct adj.
15C N.C.	C-12	15-2 80	Red-White Black	Opens direct 50 volt circuit to search index coil, coil then held in thru resistor.

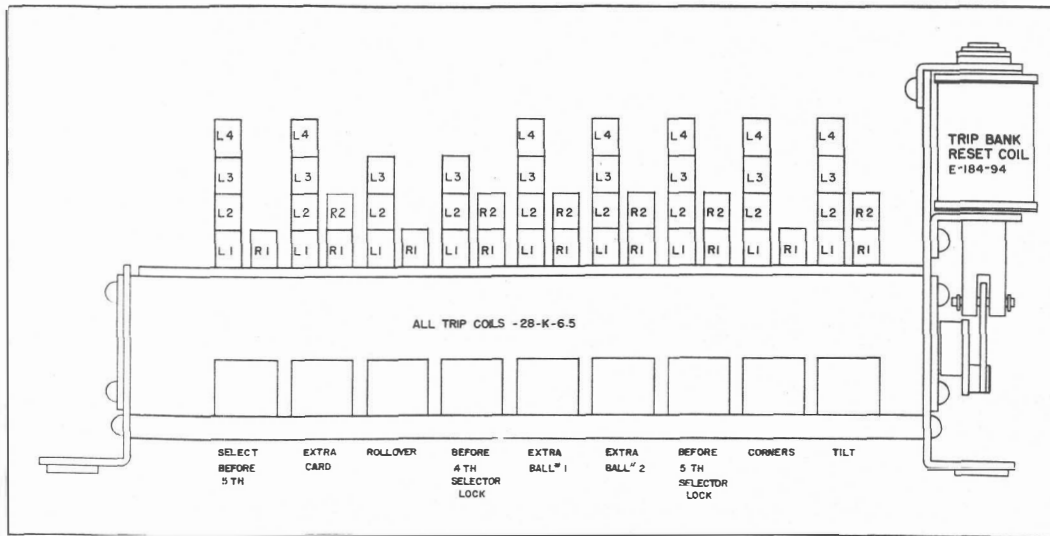
CONCLUDED ON NEXT PAGE

# CONTROL UNIT CAM SWITCH CHART — CONCLUDED

CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
SEARCH INDEX COIL	A-13	15-2 70	Red-White Orange	Energizes when 3-in-line or more is scored.
16A N. O.	B-13	40-4 80	Green Black	Energizes replay cams index coil.
16B N. C.	F-34	27-10 91-6	Blue-Orange Grey-Red	Opens circuit to Magic Lines Buttons during replay winner.
16C N. C.	I-4	83-3 30	Black-Yellow Yellow	Opens start circuit and also acts as safety switch.

## TRIP RELAY BANK PICTORIAL VIEW

NUMBERS CORRESPOND TO SWITCH-CHART



CODE	
N.C. ....	NORMALLY CLOSED
N.O. ....	NORMALLY OPEN
M.B.B. ....	MAKE BEFORE BREAK
S.P.D.T. ....	SINGLE POLE DOUBLE THROW

## TRIP RELAY BANK CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW

CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
SELECT BEFORE 5th TRIP COIL	A-33	J 70	Jumper Orange	Energized by control unit cam switch #8A, thru spotting disc. Also by yellow or red panel rollover switch, when rollover relay is tripped.
L1 S. P. D. T.	J-1	53-9 80-9 23-10	White-Yellow Black Blue-Yellow	Breaks circuit to flash "select now" lite before shooting 4th ball, and completes circuit to flash "select now" lite before shooting 5th ball.
L2 N. C.	B-33	18-10 J	Red-Black Jumper	Breaks circuit to coil.
L3 N. C.	F-21	27-7 75	Blue-Orange Orange-White	(Proportioning circuit) scores and extra balls.
L4 S. P. D. T.	L-2	57-9 80-9 43-11	White-Orange Black Green-Yellow	Breaks circuit to select before 4th ball feature lite, and completes circuit to "select before shooting 5th ball feature" lite.
R1 N. O.	H-34	20-10 98-9	Blue Gray-Black	Completes circuit to make magic-lines buttons alive.

CONTINUED ON NEXT PAGE

# TRIP RELAY BANK CHART — CONTINUED

CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
EXTRA CARD TRIP COIL	A-32	J 70	Jumper Orange	Energized by control unit cam switch #8A, thru spotting disc.
L1 N. O.	J-8	51-9 30	White-Red Yellow	Lites "extra card" lite.
L2 N. C.	B-32	90-6 J	Gray Jumper	Breaks circuit to coil.
L3 N. O.	D-20	81-6 85-6	Black-Red Black-White	Completes circuit for white in line scoring (in extra card).
L4 N. C.	H-21	40-9 80-6	Green Black	(Proportioning circuit) scores and extra-balls.
R1 N. O.	D-18	18 98-6	Red-Black Gray-Black	Completes circuit for green-in-line scoring (in extra card)
R2 N. C.	G-22	10-1 27-7	Red Blue-Orange	(Proportioning circuit) scores and extra-balls.
ROLLOVER TRIP COIL	A-32	J 70	Jumper Orange	Energized by control unit cam switch #8A, thru spotting disc.
L1 S. P. D. T.	D-33	36-10 18-10 60-10	Yellow-Brown Red-Black Brown	Breaks circuit for energizing "select before 5th ball" trip relay, thru control unit disc, and completes circuit to energize "select before 5th ball" trip relay, thru panel rollover switches.
L2 N. C.	B-32	52-8 J	White-Blue Jumper	Breaks circuit to coil.
L3 N. O.	K-3	45-5 80-9	Green-White Black	Lites "yellow or red rollover feature" lites.
R1 N. C.	G-21	31-9 75	Yellow-Red Orange-White	(Proportioning circuit) scores and extra balls.
BEFORE 4th SELECTOR LOCK TRIP COIL	A-10	J 70	Jumper Orange	Energized thru timer unit disc, when 4th ball is shot.
L1 N. O.	G-8	36-2 43-2	Yellow-Brown Green-Yellow	Completes circuit to timer unit step-up coil.
L2 N. O.	I-16	45-6 56	Green-White White-Brown	In series circuit, for replay scoring.
L3 N. C.	A-10	83-6 J	Black-Yellow Jumper	Breaks circuit to coil.
R1 N. C.	K-1	53-9 27-11	White-Yellow Blue-Orange	Breaks circuit to flash select-now lite.
R2 N. C.	H-35	20-10 98-9	Blue Gray-Black	Breaks circuit to magic-lines buttons.

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# TRIP RELAY BANK CHART — CONTINUED

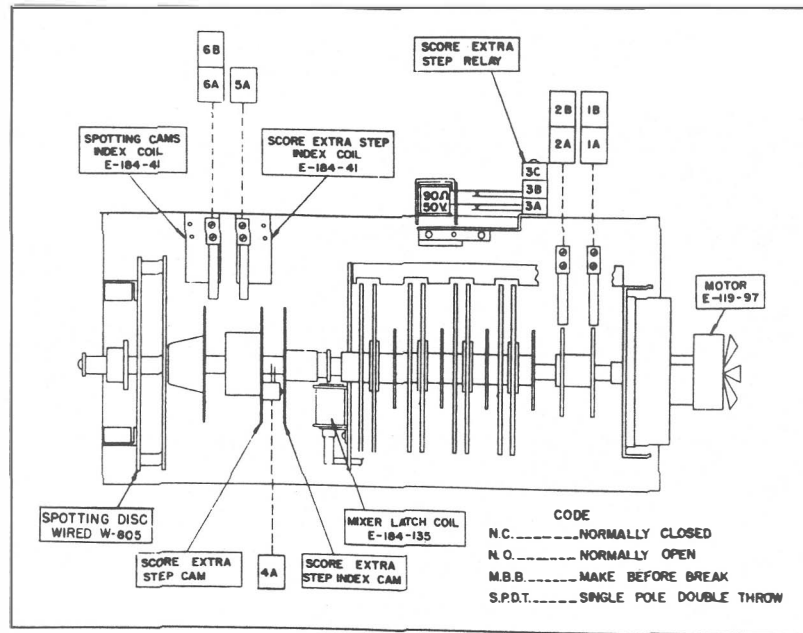
CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
EXTRA BALL #1 TRIP	A-10			Energized with extra ball #2.
L1 S.P.D.T.	E-22	85-4 30 61-2	Black-White Yellow Brown-Red	Breaks guaranteed score step circuit, and completes circuit to extra ball unit for 1st step.
L2 N.C.	E-23	85-4 91-11	Black-White Gray-Red	Safety circuit. (Anti-cheat relay).
L3 N.C.	H-22	45-2 83-9	Green-White Black-Yellow	Breaks circuit for getting other game advantages, during extra ball play.
L4 S.P.D.T.	G-22	63-4 27-7 18-2	Brown-Yellow Blue-Orange Red-Black	Breaks score step circuit, and completes circuit for extra-ball steps.
R1 N.O.	H-22	10-1 54-8	Red White-Green	(Proportioning circuit) scores and extra-balls.
R2 N.O.	J-22	21-4 30	Blue-Red Yellow	Completes circuit to extra balls lite.
EXTRA BALL #2 TRIP COIL	A-10	25-7 70	Blue-White Orange	Energized by yellow button switch, thru before 5th selector lock trip relay switch.
L1 S.P.D.T.	J-16	31-5 13-4 74	Yellow-Red Red-Yellow Orange-Green	Breaks circuit for flashing other game advantage lites, and completes circuit for flashing extra ball lites.
L2 N.C.	B-10	25-7 38-2	Blue-White Yellow-Black	Breaks circuit to coil.
L3 N.C.	K-12	36-5 61-4	Yellow-Brown Brown-Red	Breaks circuit for flashing other game advantage lites, during extra ball play.
L4 S.P.D.T.	D-6	14-3 43-9 98-2	Red-Green Green-Yellow Gray-Black	Breaks circuit to shutter motor, and completes circuit to mixer latch and timer cams index coils, during extra ball play.
R1 S.P.D.T.	I-22	75-5 15-7 45-2	Orange-White Red-White Green-White	Proportioning circuit.
R2 N.O.	D-12	38-3 91-1	Yellow-Black Gray-Red	Completes circuit to ball lifter motor, during extra ball play.
BEFORE 5th SELECTOR LOCK TRIP COIL	A-9	J 70	Jumper Orange	Energized thru timer unit disc, when 5th ball is shot.
L1 N.O.	B-10	25-8 38-2	Blue-White Yellow-Black	Completes circuit to extra ball trip relays, for extra ball play.
L2 N.C.	B-9	74-6 J	Orange-Green Jumper	Breaks circuit to coil.
L3 N.O.	E-4	18-6 50-2	Red-Black White	Completes circuit to make yellow button alive, for extra ball play.
L4 N.C.	G-34	91-6 20-10	Gray-Red Blue	Breaks circuit to magic lines buttons.
R1 N.O.	D-8	27-2 78-6	Blue-Orange Orange-Black	Completes circuit to timer unit step-up coil.
R2 N.C.	K-4	53-10 80-9	White-Yellow Black	Breaks circuit to flash "select now" lite.

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# TRIP RELAY BANK CHART — CONCLUDED

CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
CORNERS TRIP COIL	A-33	J 70	Jumper Orange	Energized by control unit cam switch #8A, when circuit complete thru other factors.
L1 N. O.	J-7	48-9 30	Green-Black Yellow	Completes circuit to main card corners score 5-in-line feature lite.
L2 N. C.	B-33	14-11 J	Red-Green Jumper	Breaks circuit to coil.
L3 N. O.	G-16	13-1 71-3	Red-Yellow Orange-Red	Part of corners replay scoring circuit.
L4 N. O.	D-16	52-2 57-10	White-Blue White-Orange	Part of corners replay scoring circuit.
R1 N. C.	C-31	10-2 75-3	Red Orange-White	(Proportioning circuit) selection feature steps.
TILT TRIP COIL	A-11	14-5 70	Red-Green Orange	Energized by any tilt switch, or the plumb-bob tilt. Also at 39th step of the timer unit.
L1 S. P. D. T.	I-6	21-3 30 45-8	Blue-Red Yellow Green-White	Breaks circuit for game advantages, replay scoring, ball counting, and completes circuit to shutter motor.
L2 N. C.	H-34	40-8 98-9	Green Gray-Black	Breaks circuit to magic lines buttons.
L3 N. C.	L-23	10 20-4	Red Blue	Breaks 17 volt circuit.
L4 S. P. D. T.	L-22	38 81 91-2	Yellow-Black Black-Red Gray-Red	Breaks 6 volt circuit, and completes circuit to tilt lite.
R1 N. O.	D-11	57-6 85-7	White-Orange Black-White	Safety switch, (red button relay circuit).
R2 N. C.	G-1	20-P 60-P	Blue(Plastic) Brown(Plastic)	Breaks circuit to control, magic lines, and mixer and spotting unit motors.

# MIXER AND SPOTTING UNIT ASSEMBLY NUMBERS CORRESPOND TO SWITCH CHART BELOW

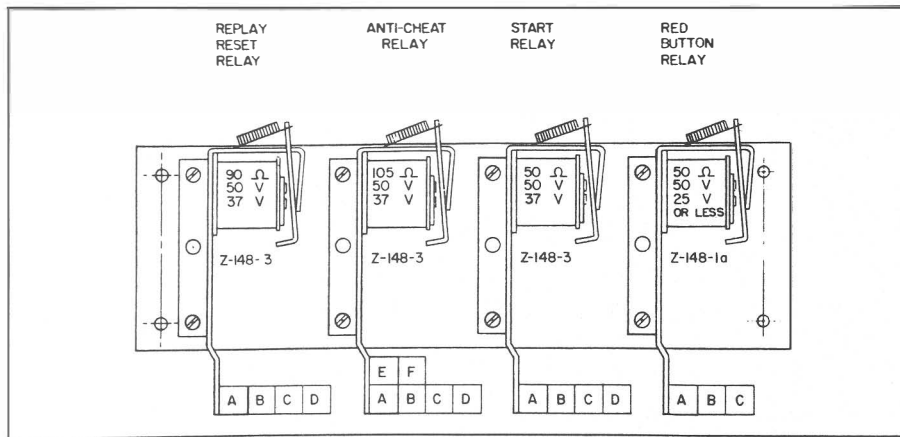


## MIXER AND SPOTTING UNIT CAM SWITCH CHART

FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ABOVE

CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
1A	N.O.	L-1	80-9 90-8 Black Gray	Flashes "select now" lite.
1B	N.O.	G-26	14-8 80-8 Red-Green Black	Pulses "selection feature" unit for multiple steps.
2A	N.O.	D-3	75-2 53-7 Orange-White White-Yellow	Pulses replay register reset coil.
2B	N.O.	B-22	78 38-4 Orange-Black Yellow-Black	Pulses extra ball step-up coil for multiple steps.
SCORE EXTRA STEP RELAY COIL	A-36	43-6 70	Green-Yellow Orange	Energized by Yellow, Red, Green, or White score unit step-up arm switches.
3A	N.O.	G-35	81-3 43-6 Black-Red Green-Yellow	Part of lock-in circuit for this relay.
3B	N.O.	D-25	50-4 51-6 White White-Red	Completes circuit to Yellow, Red, Green or White score unit step-up coil for multiple steps.
3C	N.C.	A-6	15-5 70 Red-White Orange	Breaks circuit to mixer latch and timer cams index coils. (Safety switch.)
4A	N.O.	E-25	85-4 50-4 Black-White White	Pulses Yellow, Red, Green or White score unit step-up coil for multiple steps.
SCORE EXTRA STEP INDEX COIL	A-39	25-9 70	Blue-White Orange	Energized during timing cam cycle by control unit cam switch #6B.
5A	N.O.	G-35	13-5 81-3 Red-Yellow Black-Red	Completes lock in circuit for score extra step relay.
SPOTTING CAMS INDEX COIL	A-39	98-1 70	Gray-Black Orange	Energized during timing cam cycle by control unit cam switch #4A.
6A	N.O.	J-16	13-4 30 Red-Yellow Yellow	Completes "game advantages" flash circuit. Also flashes extra ball lites, during extra ball play.
6B	N.O.	J-11	61-9 30 Brown-Red Yellow	(Same as above).

# 4 RELAY BANK PICTORIAL VIEW NUMBERS CORRESPOND TO SWITCH CHART



Coil part numbers	
50 Ω	50 V - C-2794-9
90 Ω	50 V - C-2794-1
105 Ω	50 V - C-2794-23

Code	
N.C.	Normally Closed
N.O.	Normally Open
M.B.B.	Make Before Break
S.P.D.T.	Single Pole Double Throw

# 4 RELAY BANK SWITCH CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW

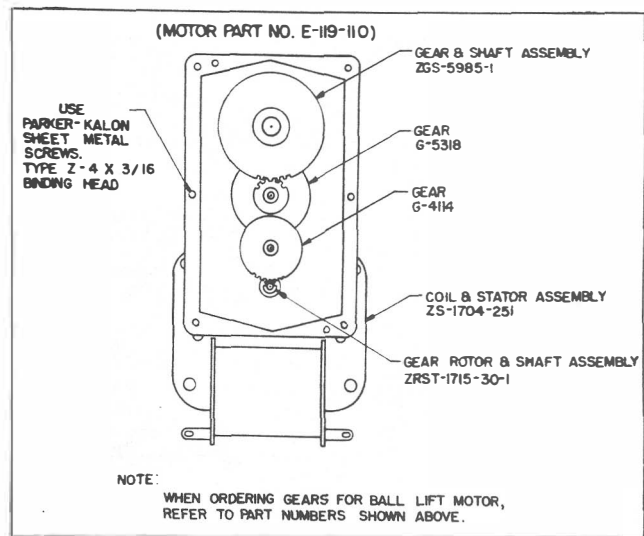
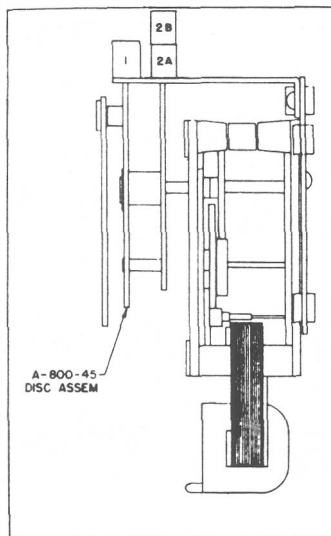
RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
REPLAY RESET RELAY COIL	A-4	75-2 70	Orange-White Orange	Energizes when anti-cheat relay drops out.
A S.P.D.T.	C-3	90-5 13-9 53-7	Gray Red-Yellow White-Yellow	Directs replay register reset circuit thru control unit cam switch #2A, when replays are being played, or thru 16 pulse cam switch #2A, when replays are being cancelled.
B N.O.	G-3	56-2 75-2	White-Brown Orange-White	Lock-in switch for this relay.
C N.O.	G-1	20-P 60-P	Blue (Plastic) Brown(Plastic)	Completes circuit to control unit, and mixer & spotting unit motors, when replays are being cancelled.
D N.C.	C-4	21-6 63-2	Blue-Red Brown-Yellow	Opens start circuit during replay cancel.
ANTI-CHEAT RELAY COIL	A-24	78-4 70	Orange-Black Orange	Energized thru control unit cam switch #4C, its switches protect replay, game advantage, and lite circuits.
A S.P.D.T.	G-4	75-2 56-2 50-2	Orange-White White-Brown White	Breaks start relay circuit, and completes circuit to replay reset relay when this relay drops out.
B N.O.	D-24	78-4 30	Orange-Black Yellow	Lock-in switch for this relay.
C N.O.	L-23	20-4 80-1	Blue Black	Breaks 17 volt circuit, when this relay drops out.
D N.C.	E-10	57-6 85-7	White-Orange Black-White	Safety switch. (Red button relay circuit.)
E S.P.D.T.	L-21	91-2 38 54-2	Gray-Red Yellow-Black White-Green	Breaks 6 volt circuit, and lites tilt lite, when this relay drops out.
F N.C.	H-7	45-8 23-9	Green-White Blue- Yellow	Safety switch. (Shutter motor circuit.)

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# 4 RELAY BANK SWITCH CHART — CONCLUDED

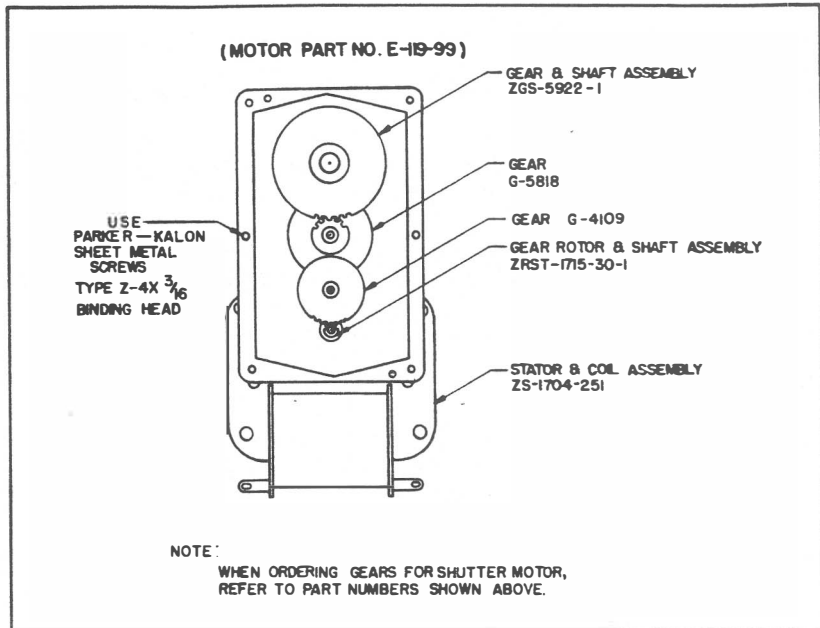
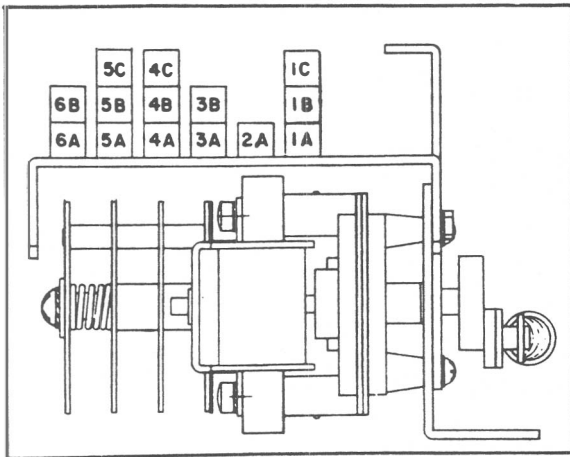
RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
START RELAY COIL	A-4	21-6 70	Blue-Red Orange	Energized every time a coin is played, or when red or yellow button is pressed.
A N. C.	B-22	75-4 78	Orange-White Orange-Black	Opens extra ball step-up circuit during spin.
B N. C.	H-22	14-8 83-9	Red-Green Black-Yellow	Opens game advantage circuits during spin
C N. O.	F-6	13-3 90-9	Red-Yellow Black-White	Completes circuit to timer cams index, and mixer latch coils.
D N. O.	F-4	48-2 63-2	Green-Black Brown-Yellow	Lock-in switch for this relay.
RED BUTTON RELAY COIL	A-10	85-7 70	Black-White Orange	Energizes when red button is pressed.
A S. P. D. T.	C-6	93-2 98-2 14-3	Gray-Yellow Gray-Black Red-Green	Directs circuit from mixer latch, and timer cams index coils during extra ball play, to shutter motor when starting new game after extra ball play.
B N. O.	D-10	31-7 27-8	Yellow-Red Blue-Orange	Lock-in switch for this relay.
C N. C.	K-22	50-9 21-4	White Blue-Red	Opens extra ball lite circuit.

## BALL LIFT MOTOR PICTORIAL VIEW



CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCH
1 N. O.	G-12	30 91-1	Yellow Grey-Red	Carry-over switch for ball lifter motor.
2A N. O.	E-7	43-2 27-2	Green-Yellow Blue-Orange	Energizes timer unit step-up coil.
2B N. O.	C-9	57-7 93-9	White-Orange Gray-Yellow	Energizes before 4th selector lock trip relay, at 4th step of timer unit.

# SHUTTER MOTOR PICTORIAL VIEW



# SHUTTER MOTOR CAM SWITCH CHART FOR POSITION OF SWITCHES SEE PICTORIAL VIEW

CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
1A N.C.	I-13	93 21-3	Gray-Yellow Blue-Red	Completes circuit to replay scoring circuit.
1B N.O.	G-6	30 14-3	Yellow Red-Green	Carry thru for shutter motor.
1C N.C.	I-8	21-3 98-8	Blue-Red Gray-Black	Safety switch. (timer reset circuit).
2A N.C.	F-12	31-3 36-3	Yellow-Red Yellow-Brown	Completes circuit to ball lifter motor (closed normally) open during shutter cycle.
3A N.O.	C-38	30 85-5	Yellow Black-White	Resets extra ball, and Yellow, Red, Green replay counter units.
3B N.O.	H-2	20-P 70-P	Blue (Plastic) Brown(Plastic)	Resets trip relay bank.
4A N.O.	F-6	18-3 14-3	Red-Black Red-Green	(Closed when shutter is open). Completes circuit to shutter motor.
4B N.C.	I-33	21-3 40-8	Blue-Red Green	Safety switch for "magic lines" button circuits.
4C N.O.	H-6	45-8 18-3	Green-White Red-Black	Starts shutter motor if game is tilted when shutter is open.
5A N.C.	H-8	98-8 65-2	Gray-Black Brown-White	Safety switch (timer reset circuit).
5B N.O.	E-37	31-4 91-4	Yellow-Red Gray-Red	Safety circuit (lifter start relay).
5C S.P.D.T.	E-5	43-9 13-3 93-2	Green-Yellow Red-Yellow Gray-Yellow	Breaks circuit to shutter motor and makes circuit to timer cams index and mixer latch coils.
6A N.O.	G-8	30 71-8	Yellow Orange-Red	Completes circuit to timer reset coil.
6B N.O.	C-39	30 78-3	Yellow Orange-Black	Resets White, Yellow, Red, Green score units, score units. Also resets selection feature unit, and White replay counter



# MISCELLANEOUS PARTS

## Back Cabinet Assembly:

Part No.	
G-280	Back glass
M-281-14	Lock and Keys (2) keyed alike
E-122-19	Transformer

## Back Door Assembly:

M-281-24	Lock and Keys (2) keyed alike
E-300-73	Search relay bank assembly

## Front Cabinet Assembly:

M-168-15	Ball
AS-187-13	Ball shooter assembly
A-1540	Ball shooter housing
A-100-7	Ball shooter rod
SP-200-24	Ball shooter spring (long)
SP-243	Ball shooter spring (short)
R-108-3	Ball shooter tip
A-429-15	Ball trough runway assembly
P-1900-18	Cash box
A-1726	Cash box cover
E-130-10	Counter—48 volt
CA-350-1	Legs
M-163-4	Leg adjuster
M-106	Leg bolt
M-310-2	Leg-Anti-split bolt
M-497	Wire (long) for A-429-15 trough
M-497-1	Wire (short) for A-429-15 trough

## Front Door Assembly:

Part No.	
A-1729-4	Button—metal
C-2342-102	Coil for coin kicker assembly
E-101-45	Coil for coin lock out
AS-1316	Coin kicker assembly
AS-277-33	Coin switch assembly 5¢
AS-277-34	Coin switch assembly 10¢
CA-567-53	Front door only
AS-1721	Front door assembly 5¢
AS-1721-1	Front door assembly 10¢
A-254-33	Hinge and bracket
M-281-6	Lock and keys
E-108-32	Micro switch for coin switch assembly 5¢ and 10¢ play
P-2768-5	Ring-red for A-1729-4 button
P-2768-6	Ring-yellow for A-1729-4 button
P-2768-7	Ring for M-281-6 lock
M-280-15	Slug rejector 5¢
M-280-16	Slug rejector 10¢

## Front Moulding Assembly:

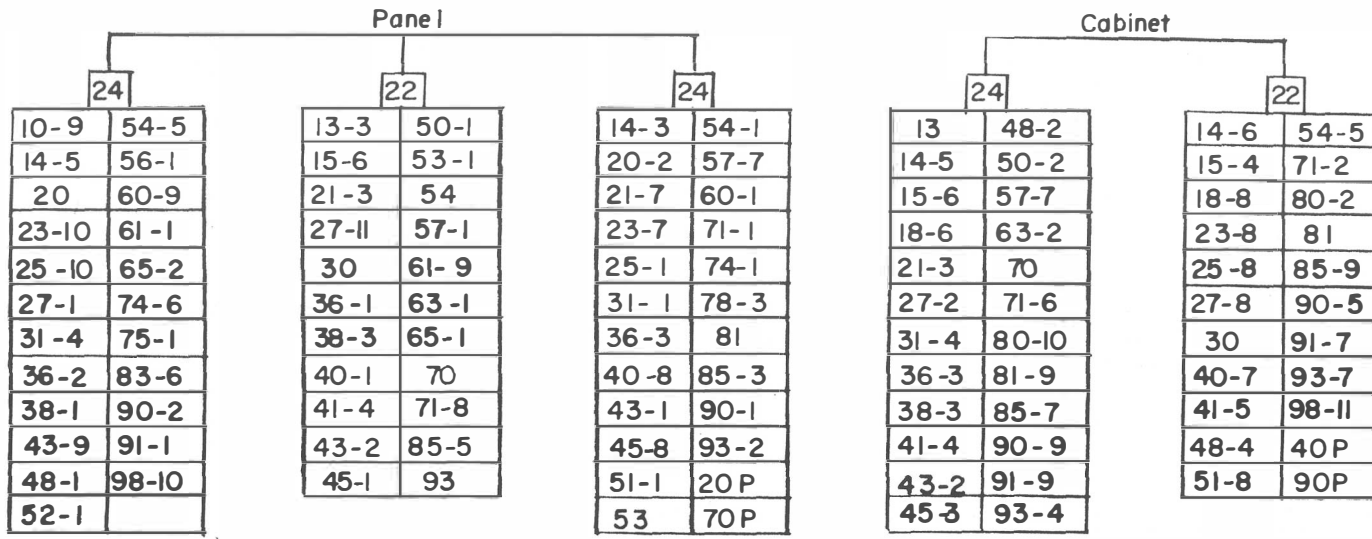
AS-1305-12	Front moulding assembly complete
A-1272-23	“A” Button
A-1272-24	“B” Button
A-1272-25	“C” Button
A-1272-26	“D” Button
A-1272-27	“E” Button
P-2210-8	5¢ Plate
P-2210-9	10¢ Plate
P-2210-36	Plate for A-B & D-E Buttons
P-2210-38	Plate for “C” Button
CA-892-2	Front moulding only

## Panel Assembly - Top:

AS-1315	Ball gate and switch assembly
C-326-9	Light Shield post
R-115-4	Rebound rubber
M-170	Rebound spring-Double post
R-243	Rubber ring for Yellow post
R-243-2	Rubber ring for Red post

Bally pin game lubricant now available in one half-pint (8 Oz.) containers with plastic spout and screw cap.





Front Door

18

13	50-2
14-5	63-2
18-6	70
21-3	71-2
23-8	81-9
25-8	85-7
27-8	90-9
40-7	93-4
48-2	

Transformer

12

20	81
30	20P
40	40P
54-2	50P
70	90P
80-1	

#603 MISS AMERICA