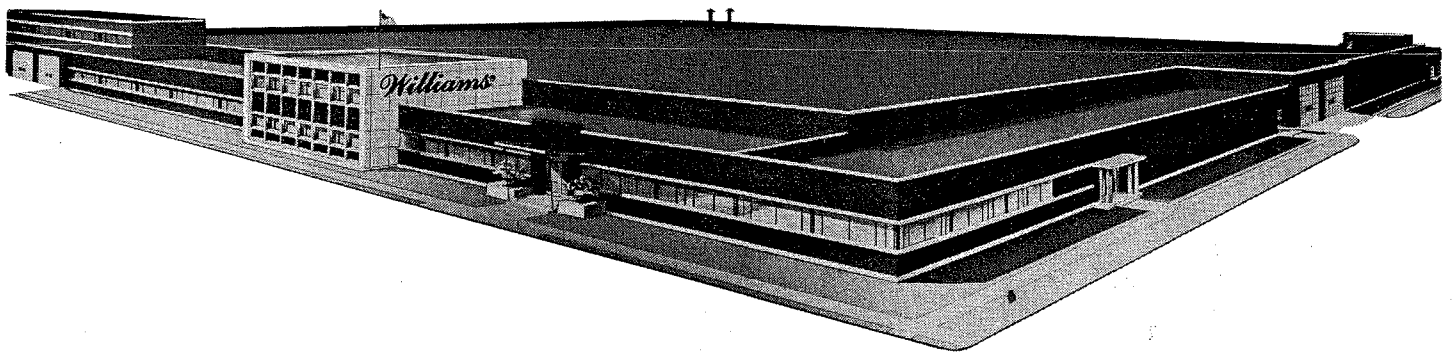


Instruction Manual

for

POST TIME



Williams[®] ELECTRONICS, INC.
SUBSIDIARY OF THE SEEBURG CORPORATION

3401 N. California Ave.
Phone 267-2240

Chicago, Ill. 60618, U.S.A.
Cable Address: Wilcoin

IMPORTANT NOTICE

KINDLY INFORM LOCATIONS THAT THEY CAN TURN DISPLAY LIGHTS ON BY PRESSING LEFT FLIPPER BUTTON. MACHINE CAN STILL BE SHUT OFF BY TAPPING BOTTOM OF CABINET.

MASTER SWITCH (ON-OFF) IS LOCATED UNDERNEATH FRONT PART OF CABINET.

CAUTION!

The playboard on this machine has an improved finish with excellent wearing properties. Do not under any circumstances clean the board with water, water soap solutions or harsh abrasives. Avoid such things as steel wool, kitchen cleansers or abrasive hand soap. Water will weaken the adhering of the paint to the board and abrasives shorten the board life by many thousand plays. A wax base cleaner with negligible abrasive qualities used lightly, but frequently, will extend the board life to its full capabilities.

SERVICEMAN TO REMOVE BACKGLASS:

- WITH BACK DOOR REMOVED, PULL BACK ON BRACKETS AT INSIDE TOP OF LITE BOX.**
- FROM THE FRONT OF GAME, LIFT GLASS UP AND OUT.**

WARRANTY

THE MOTORS IN ALL NEW WILLIAMS PRODUCTS ARE UN-CONDITIONALLY GUARANTEED FOR 6 MONTHS FROM DATE OF PURCHASE.

ANY DEFECTIVE MOTORS RETURNED DURING THE WARRANTY PERIOD WILL BE REPLACED FREE OF CHARGE BY YOUR WILLIAMS DISTRIBUTOR.

IMPORTANT NOTICE

WHEN ORDERING PARTS ALWAYS SPECIFY NAME OF UNIT, GAME AND SERIAL NUMBER, IN ADDITION TO A CLEAR DESCRIPTION OF THE PART AND PART NUMBER IF POSSIBLE.

UNIT PARTS LIST "POST TIME"

UNIT NAME	CONTACT DISC	WIPER ASSEMBLY	RATCHET GEAR ASSEMBLY	MOTORS
BALL COUNT	C-6937	C-6520	A-6402-5	
EXTRA BALL	C-7164	C-6520	A-6402-5	
ADVANCE	C-6417	C-6520	A-6401	
RACE	C-6417	C-6520	A-6404-19	14A-7805
TENS	-----	-----	3C-7128	(60 CYCLE)
HUNDREDS	-----	-----	3C-7128	14A-7806
THOUSANDS	-----	-----	3C-7128	(50 CYCLE)
TEN THOUSANDS	B-6297	A-6294	3C-7128	

"POST TIME" COIL CHART

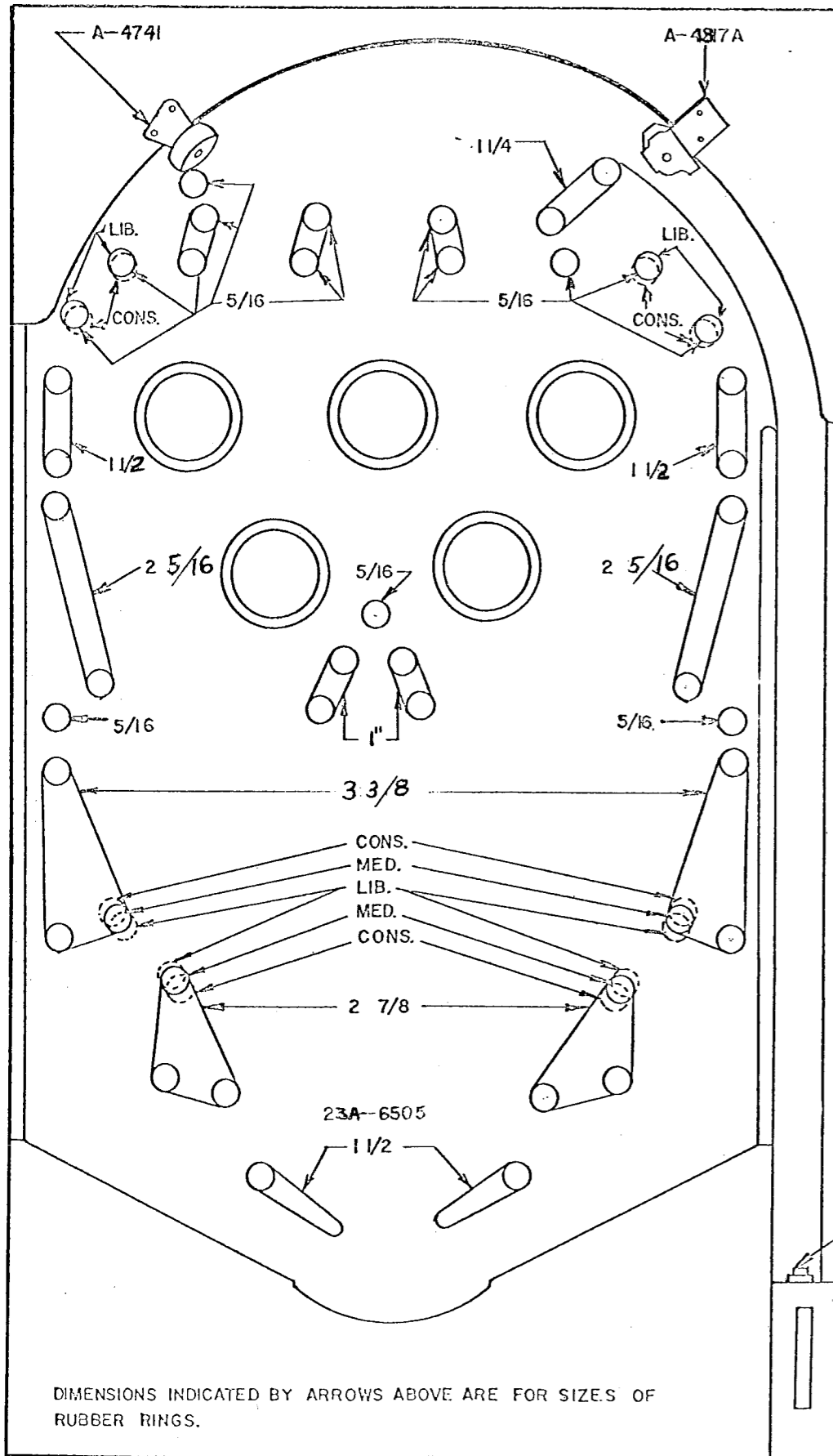
NOTICE:

THIS GAME OPERATES ON 24 VOLTS. WHEN ORDERING REPLACEMENT TRANSFORMERS, MOTORS, COILS OR METERS ... MAKE SURE TO SPECIFY CORRECT PART NUMBER.

NUMBER	DESCRIPTION	LOCATION
14 A 7805	SCORE MOTOR - 60 CYCLE	MECH. PANEL
14 A 7806	SCORE MOTOR - 50 CYCLE	MECH. PANEL
15 A 6771	TRANSFORMER - 60 CYCLE	MECH. PANEL
15 A 6773	TRANSFORMER - 50 CYCLE	MECH. PANEL
B 6396	24 VOLT METER	MECH. PANEL
<u>SOLENOID COILS</u>		
A 22-550	EXTRA BALL UNIT STEP UP BALL COUNT UNIT STEP UP BALL RELEASE	INSERT INSERT PLAYFIELD
A 23-600	ADVANCE UNIT STEP UP RACE UNIT STEP UP	PLAYFIELD PLAYFIELD
A2-23-750	KNOCKER	CABINET
B 26-800	ALTERNATOR UNIT EXTRA BALL UNIT RESET BALL COUNT UNIT RESET SCORE DRUM UNITS (4 req'd.) RACE UNIT RESET	MECH. PANEL INSERT INSERT INSERT PLAYFIELD
C2-26-800	SMALL BELL CHIME	INSERT INSERT
G 22-550	JET BUMPERS (5 req'd.)	PLAYFIELD
G 23-750	AUTO KICKERS (4 req'd.)	PLAYFIELD
G 23-600	KICKOUT UNIT (LATCH)	PLAYFIELD
FL 21-375/ 28-400	FLIPPERS (2 req'd.)	PLAYFIELD
A 21-400	KICKOUT UNIT	PLAYFIELD
<u>RELAY COILS</u>		
M1-31-1500	COIN LOCKOUT	DOOR
M2-25-400	KICKOUT UNIT (TRIP)	PLAYFIELD
M 30-1400	KICKOUT SET UP RELAY	PLAYFIELD PLAYFIELD
M 29-1000	GAME TRIP GAME OVER TRIP RESET	MECH. PANEL MECH. PANEL MECH. PANEL
M 29-1100	5¢ RELAY 10 POINT RELAY 100 POINT RELAY 1,000 POINT RELAY NO. 1 BUMPER RELAY NO. 2 BUMPER RELAY NO. 3 BUMPER RELAY NO. 4 BUMPER RELAY NO. 5 BUMPER RELAY ADVANCE RELAY	MECH. PANEL INSERT INSERT INSERT PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD
Z 27-1000	GAME LATCH GAME OVER LATCH 3 ADVANCE RELAY CENTER TARGET RELAY COIN RELAY OUTHOLE RELAY 2 PLAY RELAY	MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL
Z 28-1150	LOCK RELAY CREDIT RELAY A RELAY B RELAY C RELAY D RELAY	MECH. PANEL MECH. PANEL PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD
Z 28-1200	BALL INDEX RELAY	MECH. PANEL

"POST TIME"—POST ADJUSTMENT SHEET

TO MAKE GAME MORE "CONSERVATIVE" OR "LIBERAL"—MOVE POSTS 3/16" AS SHOWN IN SKETCH BELOW. SPOTTING HOLES ARE PROVIDED AND CAN BE SEEN ON REMOVAL OF POSTS.



DIMENSIONS INDICATED BY ARROWS ABOVE ARE FOR SIZES OF RUBBER RINGS.

ABBREVIATIONS:

CONS.— CONSERVATIVE

LIB.— LIBERAL

MED.— MEDIUM

RUBBER RING NUMBERS

23A-6300	5/13" I.D.
23A-6302	1" I.D.
23A-6303	1 1/4" I.D.
23A-6304	1 1/2" I.D.
23A-6307	2 7/8" I.D.
06	2 5/16" I.D.
08	3 3/8" I.D.

A-4741— REBOUND ASS'Y.

A-487A— BALL GATE ASS'Y.

23A-6327—BALL SHOOTER
RUBBER TIP.

"POST TIME"

RACETRACK POSITION LITES (ROLLOVER BUTTONS) ARE CONTROLLED BY ADVANCE UNIT.

THE ADVANCE UNIT MOVES ONE STEP WHEN MAKING THE FOLLOWING:
LEFT OR RIGHT TOP ROLLOVERS.
"ADVANCE" JET BUMPER.
ROLLOVER BUTTON, WHEN LIT.

THE ADVANCE UNIT MOVES 3 STEPS WHEN MAKING THE FOLLOWING:
CENTER TOP ROLLOVER.
LEFT SIDE OR RIGHT SIDE TARGET.

EACH TIME ADVANCE UNIT TAKES 10TH STEP, A RACE IS COMPLETED AND REGISTERS ON THE RACE UNIT.

THE RACE UNIT ALSO ADVANCES ONE STEP WHEN MAKING LEFT BOTTOM OR RIGHT BOTTOM (OUTSIDE) ROLLOVERS, WHEN LIT. THESE ROLLOVERS WILL LITE WHEN A,B,C AND D JET BUMPERS ARE LIT.

A,B,C AND D JET BUMPERS ARE LIT BY (4) TOP TARGETS, (2) TOP OR (2) BOTTOM ROLLOVERS, AS INDICATED ON PLAYFIELD.

SCORING THE REQUIRED NUMBER OF RACES, AS INDICATED ON INSTRUCTION CARD, WILL REGISTER AN EXTRA BALL OR 10,000 POINTS. MAKING LEFT BOTTOM OR RIGHT BOTTOM (INSIDE) ROLLOVERS, WHEN LIT, SCORES "SPECIAL" (EXTRA BALL OR 10,000 POINTS). SEE PAGE ON ADJUSTMENT JACKS.

POWER TRANSFORMER:

LOCATED ON MECHANISM PANEL, IT IS EQUIPPED WITH A SECONDARY TAP. IF YOUR GAME IS ON LOCATION WITH EXTREMELY LOW LINE VOLTAGE, REMOVE LEAD FROM LUG MARKED 24 VOLTS AND SOLDER TO ALTERNATE LUG MARKED "HIGH". THIS WILL BOOST SECONDARY VOLTAGE APPROXIMATELY 2-3 VOLTS.

LEG LEVELERS:

ARE PROVIDED FOR TWO PURPOSES - 1ST TO LEVEL GAME ON LOCATION, 2ND TO INCREASE PITCH FOR GAME PERCENTAGING. IF IT IS DESIRED TO SPEED UP PLAY AND DECREASE SCORES, RAISE REAR LEG LEVELERS TO INCREASE PITCH.

SUGGESTED SCORE CARDS:

ADD-A-BALL.....368-1EB & 368-1R

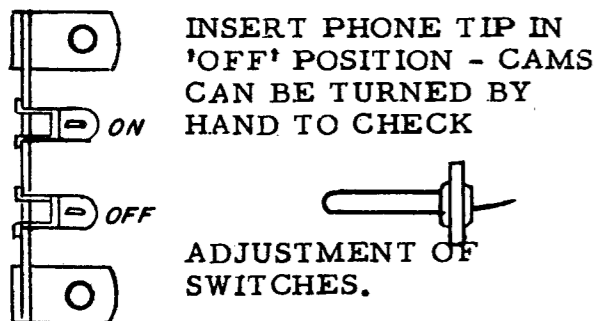
EXTENDED PLAY.....368-1EP & 368-1RP

NOVELTY PLAY.....368-1NP

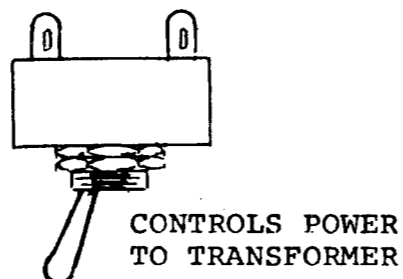
ON MECHANISM PANEL

MASTER ON-OFF SW.

Motor Service Jack



(Located under front of Cabinet)



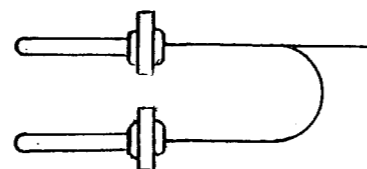
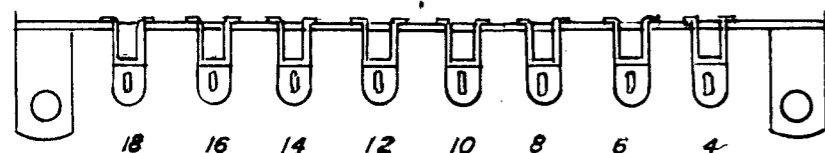
1. GENERAL

NEVER EXPERIMENT with any of the mechanism. Locate any trouble with the aid of Wiring Diagrams or Operating & Servicing Information supplied with the machine, then check for proper adjustment of the units involved before making any changes. Improper adjustment or make-shift repair will only cause serious damage to other parts of the machine or repeated failure of the part.

NOTE: Always look for a possible loose wire, bad connection at a plug and socket, broken or unhooked springs on step-up units, relays, etc., before adjustments are made or wires reconnected.

ADJUSTMENTS IN BACKBOX

RACE ADJUSTMENT



INSERT PHONE TIPS INTO POSITIONS AT WHICH EXTRA BALL OR 10,000 POINTS IS AWARDED.

2. FUSES

IMPORTANT: Never replace fuses with any rating other than specified on the fuse block; this block is located adjacent to the transformer.

3. LUBRICATION

Over-lubrication causes far more trouble in coin operated equipment than under-lubrication. Practically all cases of poor contact on switches and wiper discs are due to oil or grease, or oil vapor, which forms a film or residue on the contacts and will not allow current to pass through. Excess lubricant may also seep into clutches causing them to slip.

IMPORTANT: NEVER USE VASELINE FOR LUBRICATION OF ANY PART OF THE MACHINE. Vaseline is not a true lubricant. It leaves a dirty and gummy residue and it becomes very thick when cold. A special Coin Machine Lubricant is supplied with each machine.

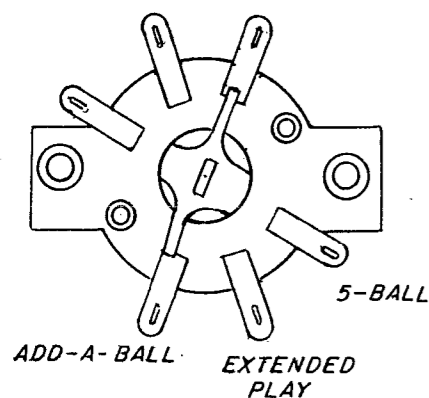
STEP-UP Levers, Ratchets, Cams, Shafts and other sliding or oscillating parts should be very lightly greased with special Coin Machine Lubricant (supplied with machine) not oftener than every six months. The bakelite discs (biscuits) on the Motor Units and Step-up Units will require lubrication with the special Coin Machine Lubricant only after the grease is completely evaporated (3 to 12 months, depending on climate) or when the film of grease becomes dirty. In either event, clean the parts thoroughly with a solvent, then apply an extremely thin coat of the special grease.

Solenoid Plungers should not have a lubricant of any kind. Should there be a sluggish tendency or if plungers are sticking, the parts should be cleaned with a solvent and flaked graphite applied on reassembly.

4. RELAY and SWITCH ADJUSTMENT

Where relay adjustments are called for, before bending blades, in all cases, on any machine, make certain that the screws holding the switch stacks are down very tightly. This is suggested because the plastic spacers in the switch stacks have occasionally shrunk by drying out, causing a poor adjustment.

GAME ADJUSTMENT

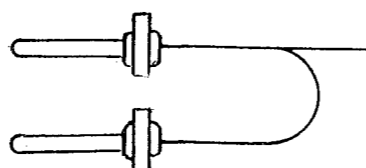
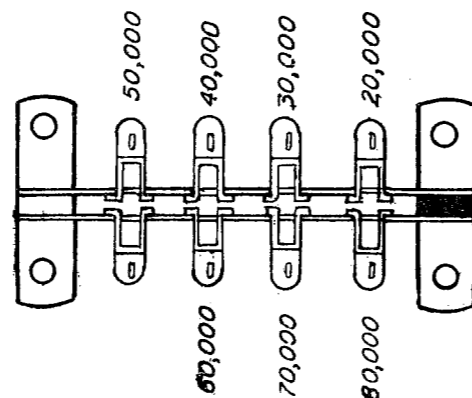


IN ADD-A-BALL POSITION, HI-SCORES, RACE SCORES AND "SPECIAL" WILL REGISTER EXTRA BALL.

EXTENDED PLAY POSITION: SAME AS ADD-A-BALL EXCEPT BALL IS AUTOMATICALLY EJECTED BACK ONTO PLAYFIELD FROM OUTHOLE AREA.

5 BALL POSITION: RACE SCORES AND "SPECIAL" SCORE 10,000 POINTS.
NOTE: ALL PHONE TIPS MUST BE REMOVED FROM "EXTRA-BALL-HI-SCORE" ADJUSTMENT JACK.

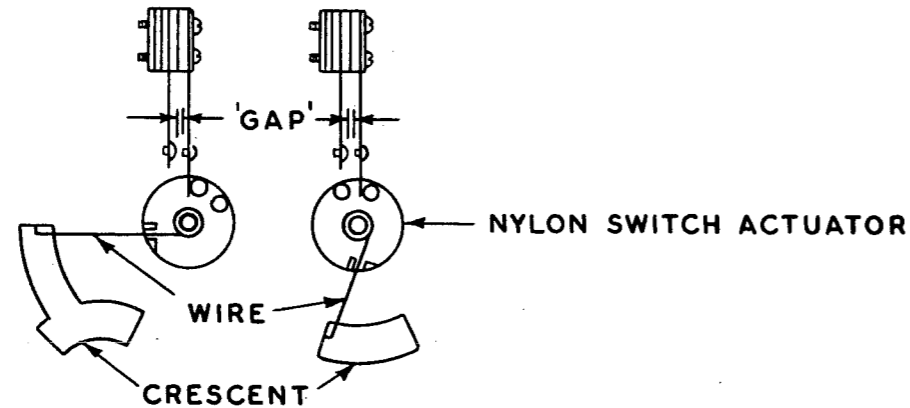
EXTRA BALL HI-SCORE ADJ.



INSERT PHONE TIPS INTO POSITIONS AT WHICH EXTRA BALL IS AWARDED.

INSTRUCTIONS FOR COIN TRIP SWITCH ADJUSTMENT

WIRE SHOULD BE IN CONTACT WITH END OF CRESCENT OPENING WHEN BLADE ADJUSTMENT IS MADE.



Long blade should be in contact with nylon switch actuator and have a maximum overtravel of 1/32.

or

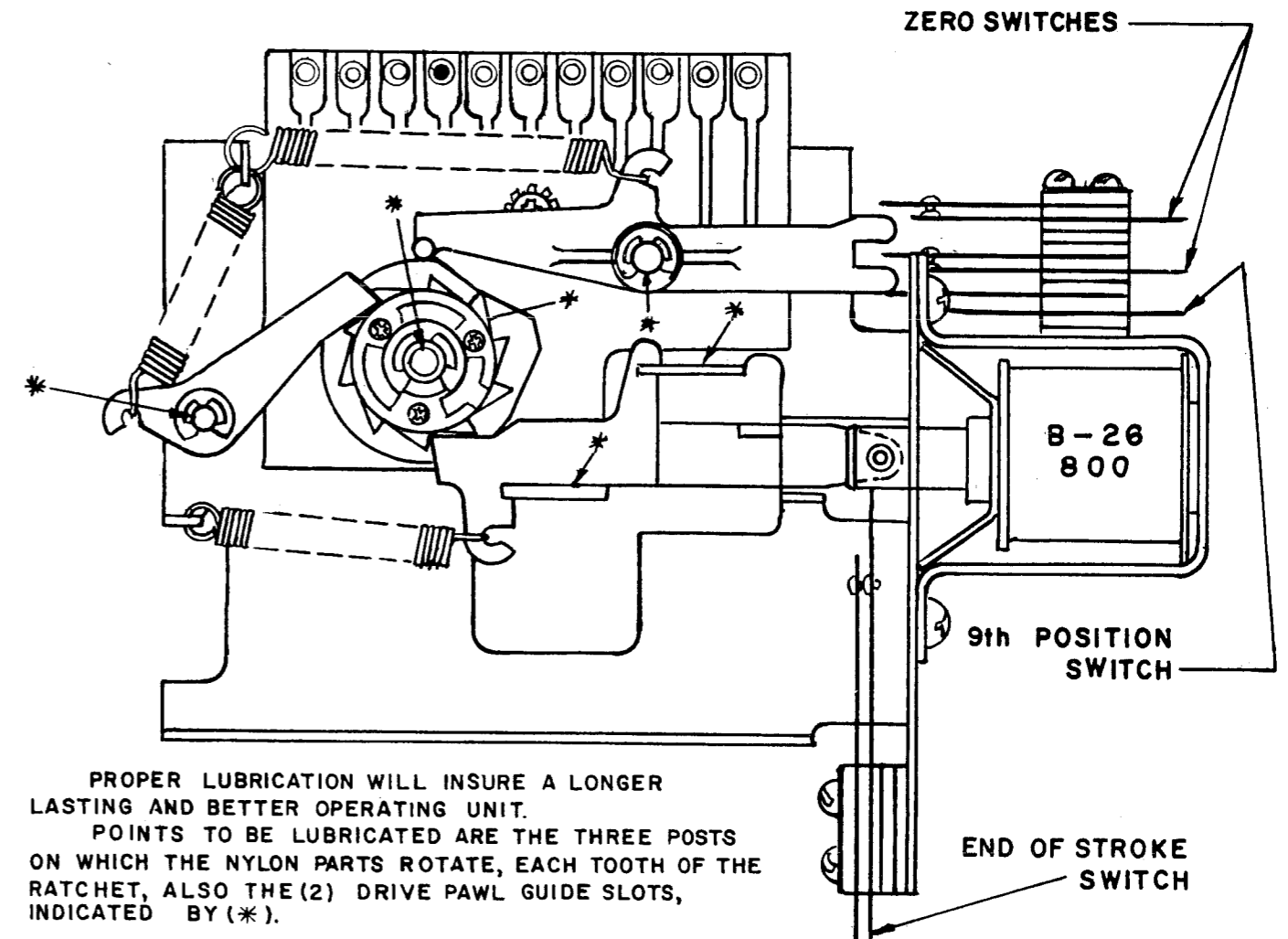
Using a gram gauge, tension of long blade should not exceed 10 grams.

SWITCH ADJUSTMENT

1. For small coins, such as dimes, adjust short blade so that the 'gap' between the silver contacts is .045 to .055.
2. For larger & heavier coins the 'gap' should be .045 to .060.
3. Do not adjust 'gap' closer than .040.

SCORE DRUM UNIT

WITH PRINTED CIRCUIT AND CONTACT RING

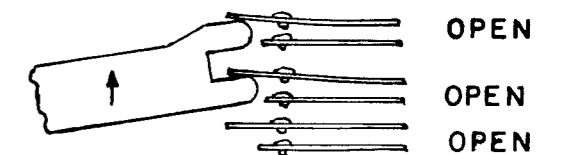


PROPER LUBRICATION WILL INSURE A LONGER LASTING AND BETTER OPERATING UNIT.
POINTS TO BE LUBRICATED ARE THE THREE POSTS ON WHICH THE NYLON PARTS ROTATE, EACH TOOTH OF THE RATCHET, ALSO THE (2) DRIVE PAWL GUIDE SLOTS, INDICATED BY (*).

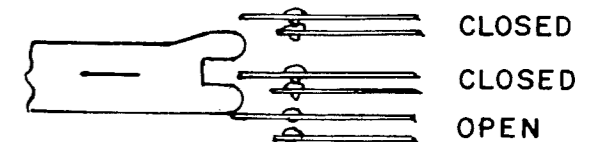
LUBRICATION: DO NOT PUT LUBRICANT ON DRIVE ARMATURE

SWITCH ADJUSTMENT

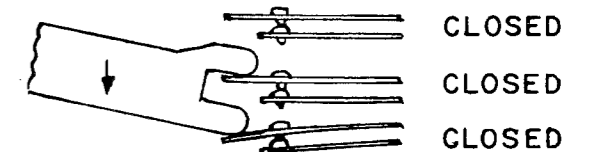
AT "0" OR INDEX POSITION ALL SWITCHES ARE OPEN AS SHOWN.



AT 1st. TO 8th. POSITION TOP SWITCHES ARE CLOSED - BOTTOM SWITCH REMAINS OPEN.



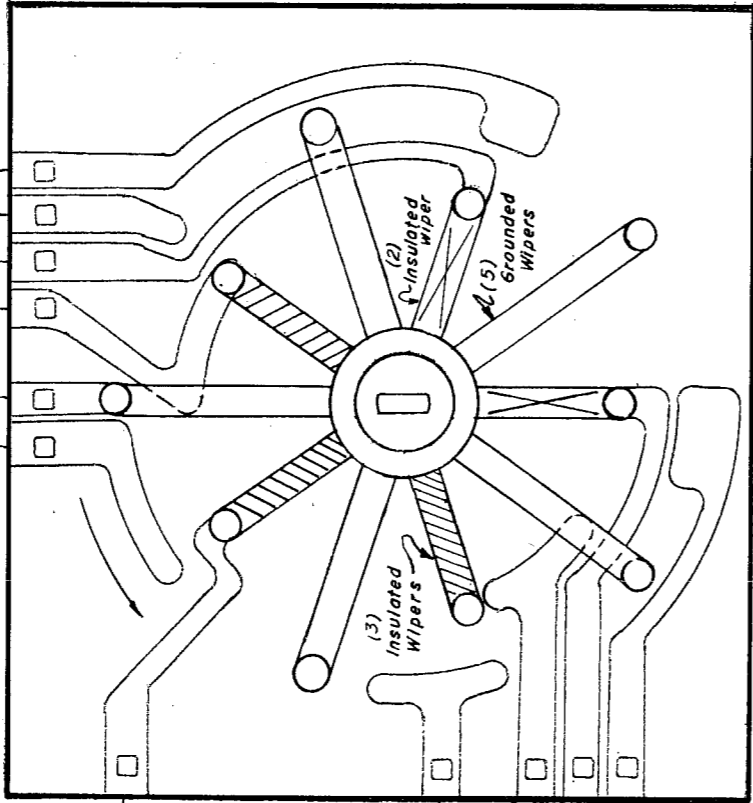
AT 9th POSITION ALL SWITCHES ARE CLOSED AS SHOWN



EXTRA BALL UNIT DISC

THIS UNIT RESETS TO ZERO, ONE STEP AT A TIME, DURING RESET CYCLE. IT ADVANCES ONE STEP WHEN MAKING HI-SCORE OR RACE SCORE, AS INDICATED ON INSTRUCTION CARD, AND BY MAKING LEFT OR RIGHT BOTTOM (INSIDE) ROLLOVER, WHEN LIT.

B-3 No. 1 EXTRA BALL LITE
 C-15 IN CIRCUIT TO KICK-OUT UNIT
 D-6 FEED TO W-BR & O-BLU
 R-BLU No. 5 EXTRA BALL LITE
 Y-BLU No. 4 EXTRA BALL LITE
 B-3 FEEDS R-B FROM SWITCH "E" ON COIN RELAY B



CIRCUIT TO BALL COUNT UNIT RESET COIL D-6

No. 2 EXTRA BALL LITE B-3

CIRCUIT TO EXTRA BALL UNIT RESET COIL D-6

TO GAME RELAY (LATCH COIL) D-5

No. 3 EXTRA BALL LITE B-3

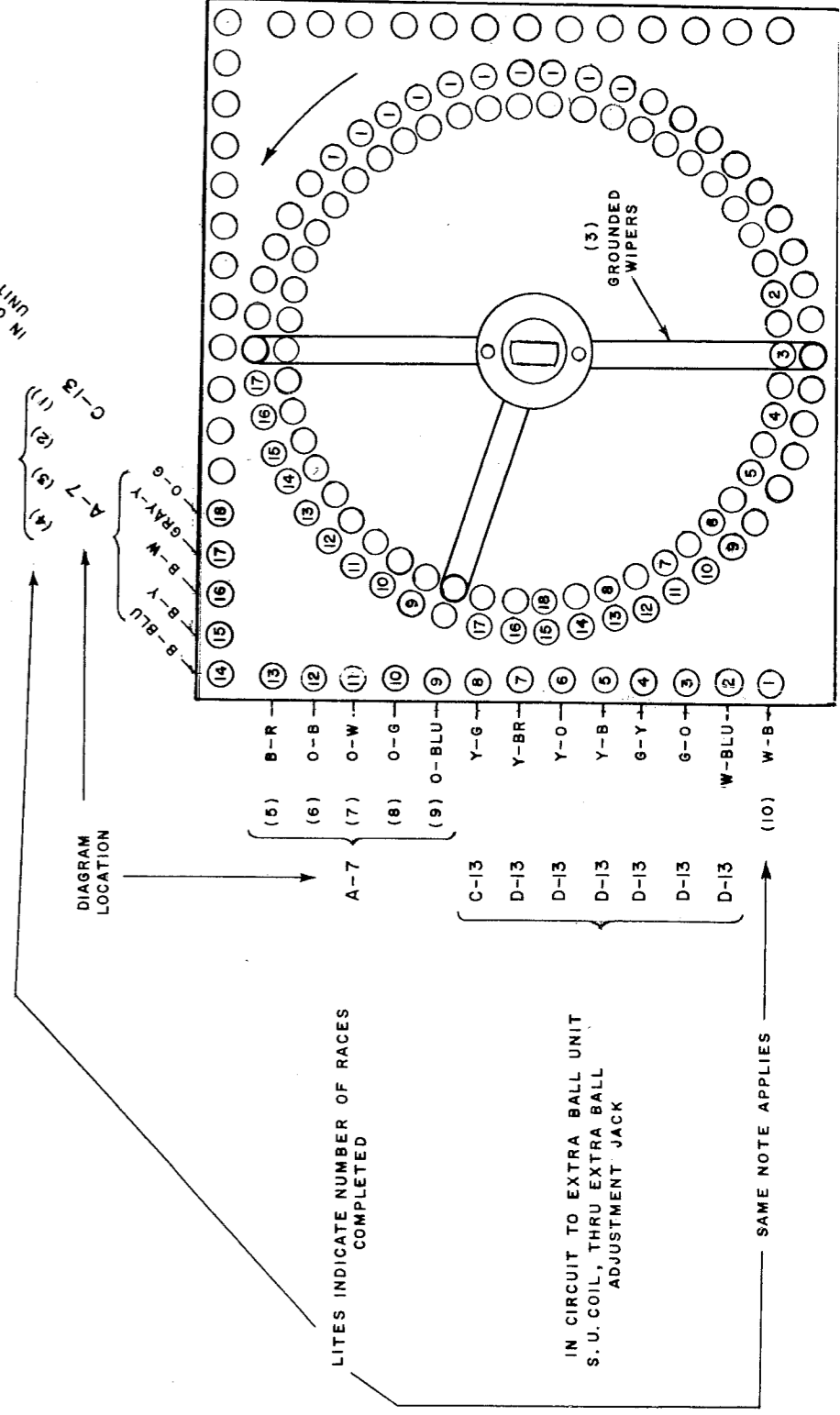
View Looking at WIPER FINGERS, with wiper in ZERO POSITION.

RACE UNIT DISC

THIS UNIT RESETS TO ZERO POSITION DURING RESET CYCLE. IT ADVANCES ONE STEP BY MAKING LEFT BOTTOM (OUTSIDE) ROLLOVER SWITCHES, WHEN LIT. ALSO BY MAKING "FINISH" ROLLOVER BUTTON SWITCH, WHEN LIT.

IN CIRCUIT TO EXTRA BALL UNIT S.U. COIL

View looking at WIPER FINGER side with WIPER in RESET position



LITES INDICATE NUMBER OF RACES COMPLETED

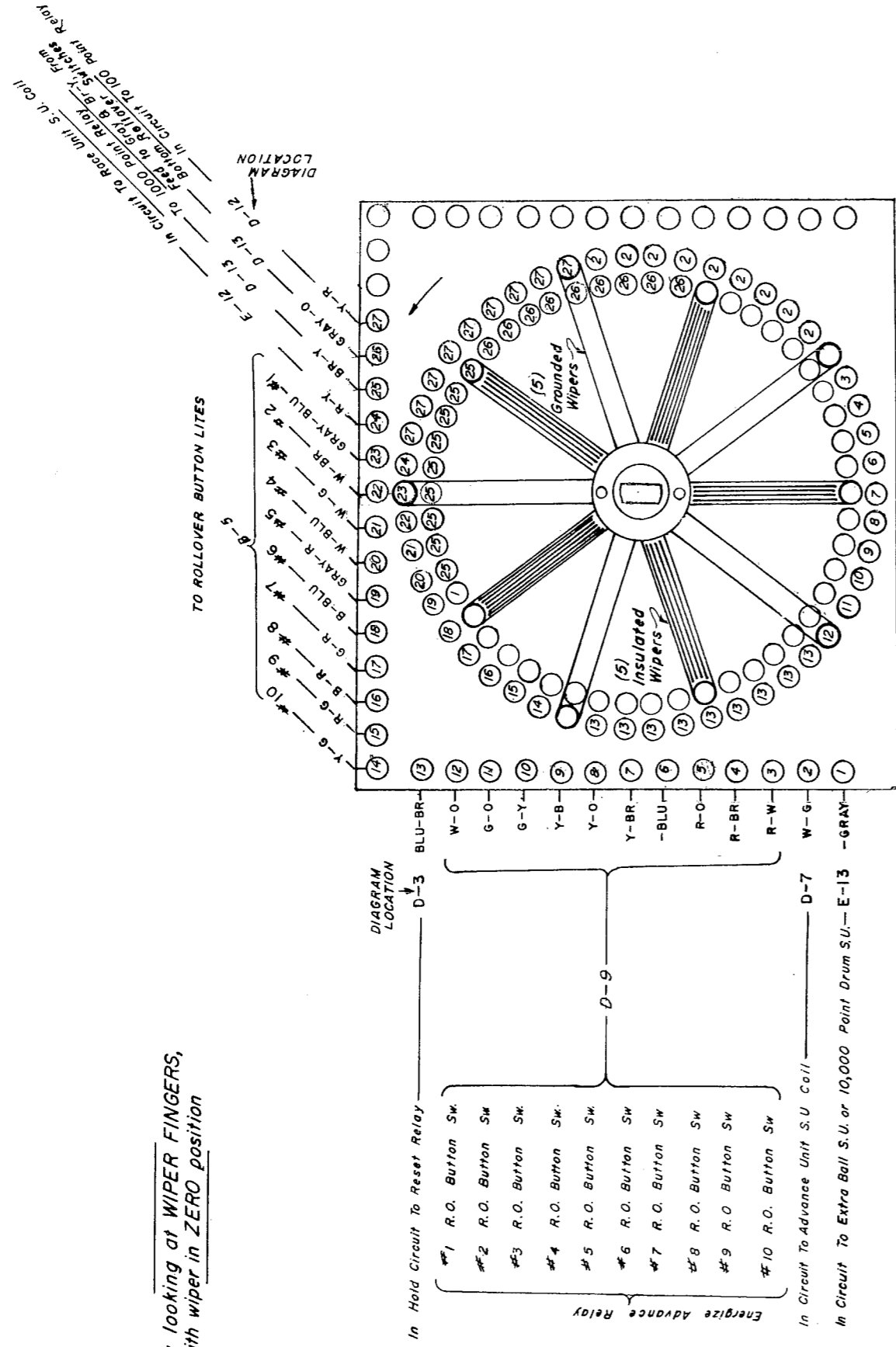
IN CIRCUIT TO EXTRA BALL UNIT S.U. COIL, THRU EXTRA BALL ADJUSTMENT JACK

SAME NOTE APPLIES

ADVANCE UNIT DISC

DURING RESET CYCLE, THIS UNIT ADVANCES TO ZERO POSITION THRU SWITCH ON RESET RELAY. DURING PLAY, IT ADVANCES ONE STEP EACH TIME THE ADVANCE RELAY IS PULSED, AND 3 STEPS WHEN THE "3 ADVANCE RELAY" IS ENERGIZED.

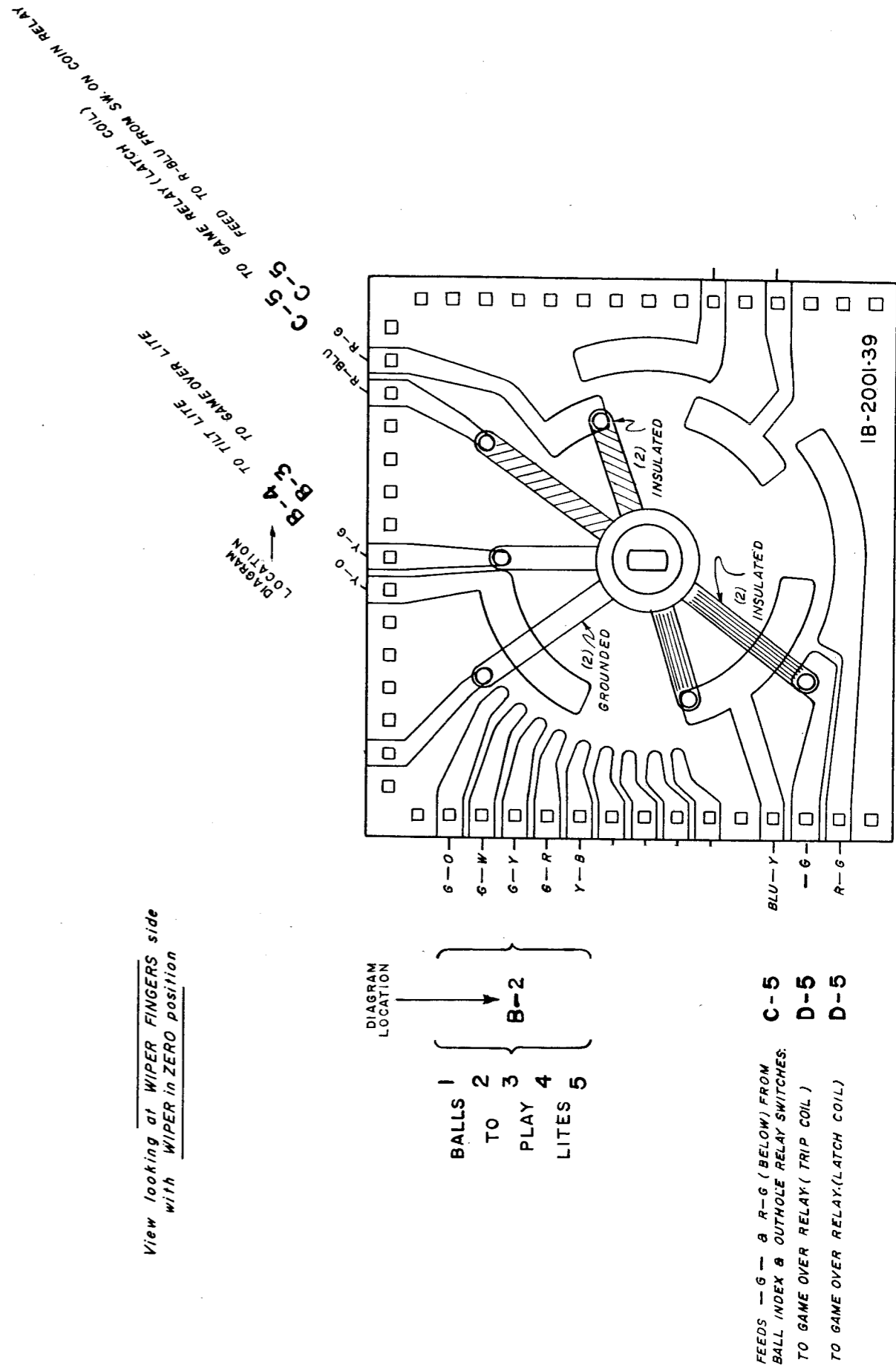
View looking at WIPER FINGERS, with wiper in ZERO position

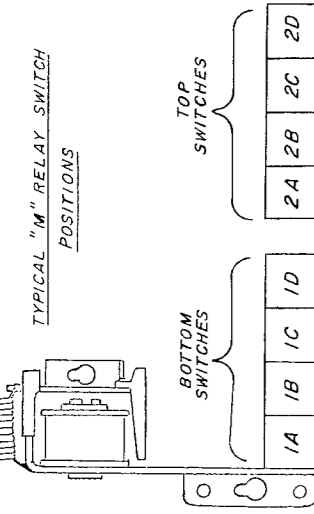


BALL COUNT S.U. DISC

THIS UNIT ADVANCES FIVE STEPS AT START OF NEW GAME. IT RESETS ONE STEP EACH TIME THE BALL LEAVES THE PLAYFIELD (MAKES THE OUTHOLE SWITCH), IF EXTRA BALL UNIT IS IN ZERO POSITION.

View looking at WIPER FINGERS side with WIPER in ZERO position



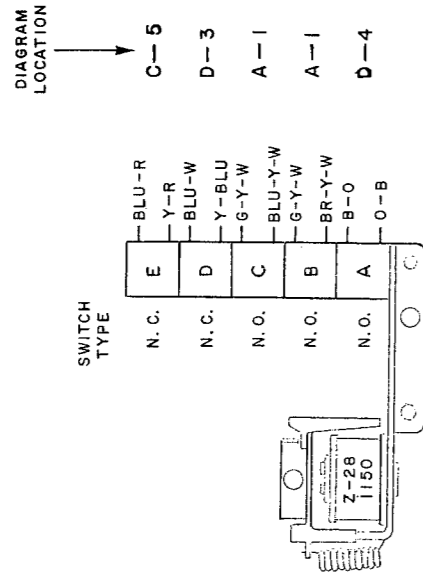


A. C. RELAYS & SWITCHES

Located on Mechanism Panel

LOCK RELAY

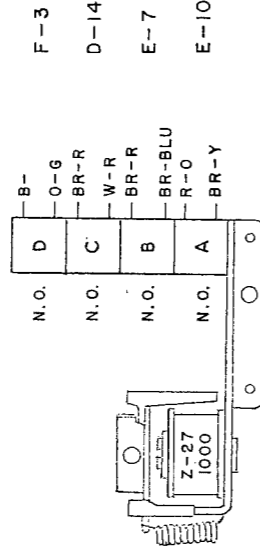
IS ENERGIZED BY COIN RELAY OR LEFT FLIPPER SWITCH.



ENERGIZES GAME-OVER RELAY (TRIP COIL).
 OPENS CIRCUIT TO RESET RELAY.
 6 VOLTS FROM TRANSFORMER TO LITES.
 6 VOLTS FROM TRANSFORMER TO LITES.
 HOLD CIRCUIT TO THIS RELAY, THRU KICK-OFF SWITCH.

3 ADVANCE RELAY

IS ENERGIZED BY LEFT OR RIGHT SIDE TARGET. ALSO BY CENTER TOP ROLLOVER SWITCH.



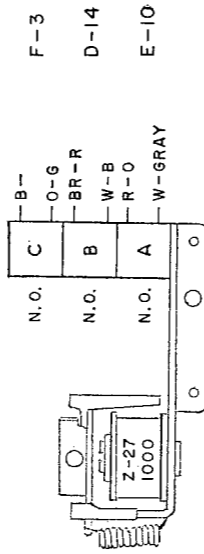
RUNS SCORE MOTOR.

PULSES 100 POINT RELAY.

PULSES ADVANCE S.U. COIL, THRU IMPULSE CAM SWITCH B.
 IN HOLD CIRCUIT TO THIS RELAY.

CENTER TARGET RELAY

IS ENERGIZED BY CENTER TARGET SWITCH.



RUNS SCORE MOTOR.

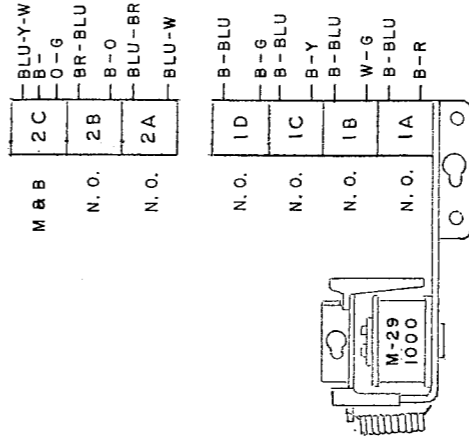
PULSES 100 POINT OR 1000 POINT RELAY, THRU SWITCH ON SET-UP RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

RESET RELAY

IS ENERGIZED BY COIN RELAY.

DIAGRAM LOCATION



OPENS CIRCUIT TO ALL PLAYFIELD SWITCHES--ALSO RUNS SCORE MOTOR.

STEPS UP ADVANCE UNIT TO ZERO POSITION.

IN HOLD CIRCUIT TO THIS RELAY.

PULSES 10,000 POINT DRUM UNIT.

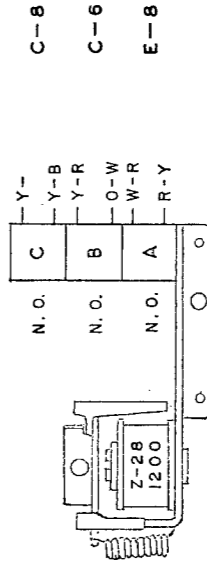
PULSES 1,000 POINT DRUM UNIT.

PULSES 100 POINT DRUM UNIT.

PULSES 10 POINT DRUM UNIT.

BALL INDEX RELAY

IS ENERGIZED BY 10 POINT, 100 POINT OR 1000 POINT RELAY.



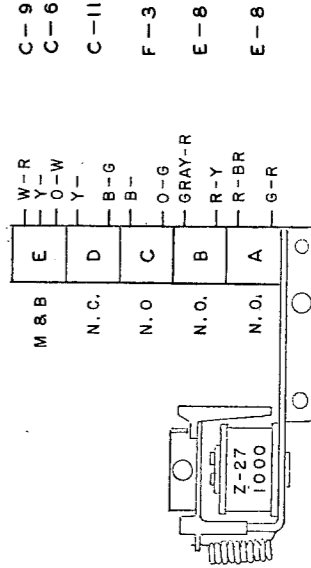
ENERGIZES GAME RELAY (TRIP COIL).

IN CIRCUIT TO GAME - OVER RELAY (TRIP & LATCH COILS)---ALSO TO BALL COUNT RESET COIL.

IN HOLD CIRCUIT TO THIS RELAY.

OUTHOLE RELAY

IS ENERGIZED BY OUTHOLE SWITCH OR KICK-OUT SWITCH.



IN SERIES WITH SWITCH A OR B ON BALL INDEX RELAY.

IN HOLD CIRCUIT TO A, B, C & D RELAYS.

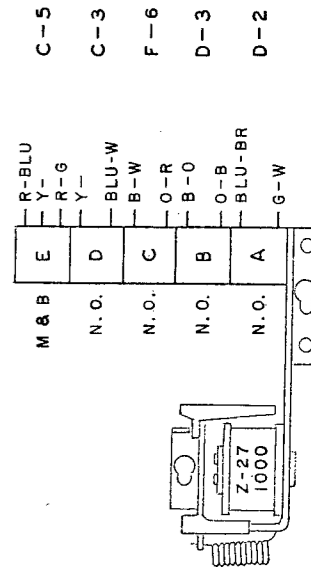
RUNS SCORE MOTOR.

ENERGIZES BALL INDEX RELAY, THRU SWITCH D ON GAME-OVER RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

COIN RELAY

IS ENERGIZED BY COIN SWITCH OR 2 PLAY RELAY. ALSO BY REPLAY BUTTON WHEN CREDIT IS AVAILABLE.



IN HOLD CIRCUIT TO CREDIT RELAY---ALSO ENERGIZES RACE UNIT RESET COIL.

ENERGIZES RESET RELAY.

ENERGIZES BALL COUNT RESET COIL.

ENERGIZES LOCK RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

GAME OVER RELAY (INTERLOCK)

LATCH COIL IS ENERGIZED BY COIN RELAY. TRIP COIL IS ENERGIZED BY OUTHOLE RELAY AND BALL INDEX RELAY, THRU BALL COUNT UNIT DISC.

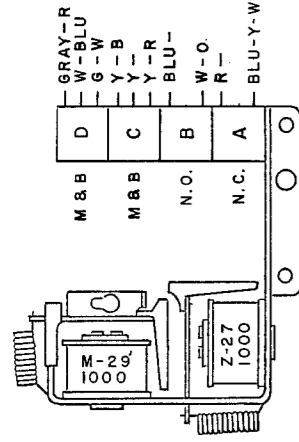
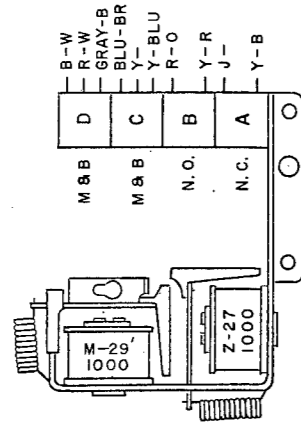


DIAGRAM LOCATION

IN CIRCUIT TO OUTHOLE RELAY.
ENERGIZES GAME RELAY (TRIP COIL)---ALSO IN CIRCUIT TO GAME-OVER RELAY (TRIP COIL).
TO "GAME-OVER" AND "TILT" LITES.
OPENS CIRCUIT TO ALL PLAYFIELD SWITCHES.

GAME RELAY (INTERLOCK)

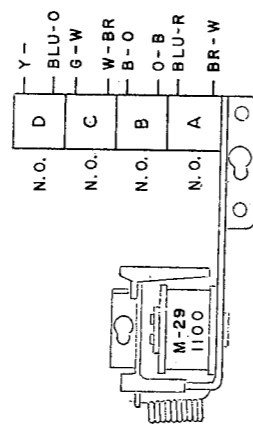
LATCH COIL IS ENERGIZED BY COIN RELAY WHEN EXTRA BALL UNIT AND BALL COUNT UNIT ARE IN RESET POSITION. TRIP COIL IS ENERGIZED BY BALL INDEX RELAY.



TO EXTRA BALL UNIT RESET COIL AND BALL COUNT UNIT S.U. COIL.
IN CIRCUIT TO COIN RELAY AND RESET RELAY.
IN CIRCUIT TO COIN RELAY, THRU COIN SWITCH.
TO GAME RELAY (TRIP COIL).

5¢ RELAY

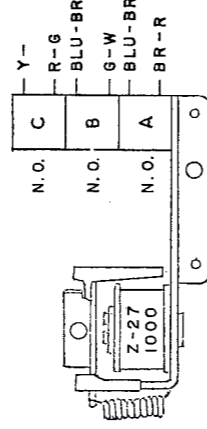
THIS RELAY IS USED ONLY ON GAMES WITH 2 COINS FOR 1 PLAY FEATURE. IT IS ENERGIZED BY 5¢ COIN SWITCH.



ENERGIZES ALTERNATOR UNIT COIL.
ENERGIZES COIN RELAY, THRU SWITCH ON ALTERNATOR UNIT.
ENERGIZES LOCK RELAY.
IN HOLD CIRCUIT TO THIS RELAY.

2 PLAY RELAY

THIS RELAY IS USED ONLY ON GAMES WITH 2 PLAYS FOR 1 COIN FEATURE. IT IS ENERGIZED BY 2 PLAY COIN SWITCH.



ENERGIZES CREDIT RELAY.
ENERGIZES COIN RELAY.
IN HOLD CIRCUIT TO THIS RELAY.

CREDIT RELAY

THIS RELAY IS USED ONLY ON GAMES WITH 2 PLAYS FOR 1 COIN FEATURE. IT IS ENERGIZED BY THE 2 PLAY RELAY.

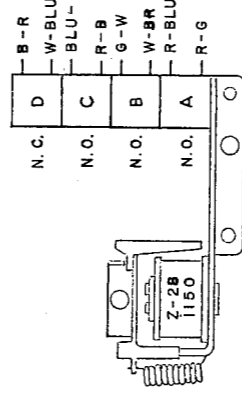


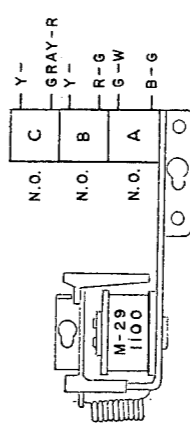
DIAGRAM LOCATION

OPENS CIRCUIT TO COIN LOCKOUT COIL.
TO CREDIT LITE.
IN CIRCUIT TO COIN RELAY, THRU REPLAY BUTTON SWITCH.
IN HOLD CIRCUIT TO THIS RELAY.

LOCATED ON PLAYFIELD

NO.1 BUMPER RELAY

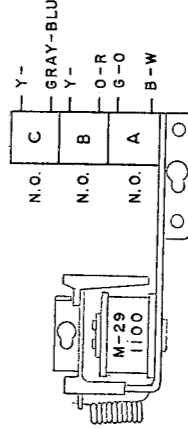
IS PULSED BY LEFT BOTTOM JET BUMPER SWITCH.



ENERGIZES LEFT BOTTOM JET BUMPER.
IN SERIES WITH SWITCH D ON "A" RELAY.
IN HOLD CIRCUIT TO THIS RELAY.

NO.2 BUMPER RELAY

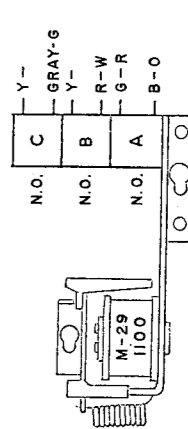
IS PULSED BY CENTER JET BUMPER SWITCH.



ENERGIZES CENTER JET BUMPER.
PULSES ADVANCE RELAY.
IN HOLD CIRCUIT TO THIS RELAY.

NO.3 BUMPER RELAY

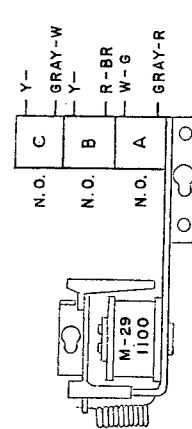
IS PULSED BY LEFT TOP JET BUMPER SWITCH.



ENERGIZES LEFT TOP JET BUMPER.
IN SERIES WITH SWITCH D ON "B" RELAY.
IN HOLD CIRCUIT TO THIS RELAY.

NO.4 BUMPER RELAY

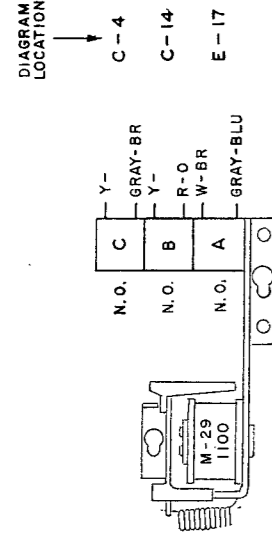
IS PULSED BY RIGHT TOP JET BUMPER SWITCH.



ENERGIZES RIGHT TOP JET BUMPER.
IN SERIES WITH SWITCH D ON "C" RELAY.
IN HOLD CIRCUIT TO THIS RELAY.

NO. 5 BUMPER RELAY

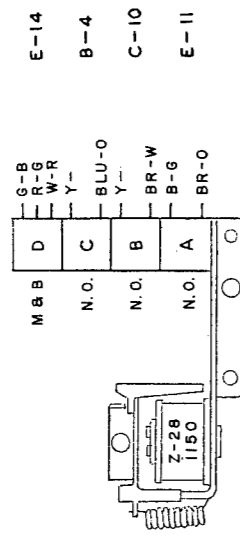
IS PULSED BY RIGHT BOTTOM JET BUMPER SWITCH.



ENERGIZES RIGHT BOTTOM JET BUMPER.
IN SERIES WITH SWITCH D ON "D" RELAY.
IN HOLD CIRCUIT TO THIS RELAY.

"A" RELAY

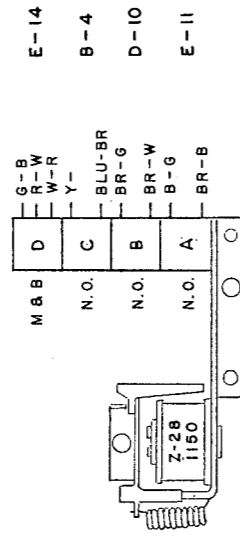
IS ENERGIZED BY LEFT TOP TARGET (OUTSIDE)---ALSO BY LEFT TOP OR LEFT BOTTOM ROLLOVER SWITCH.



OPENS CIRCUIT TO 10 POINT RELAY AND CLOSES TO 100 POINT RELAY.
TO LEFT BOTTOM JET BUMPER LITE.
IN SERIES WITH SWITCH B ON "B" RELAY.
IN HOLD CIRCUIT TO THIS RELAY.

"B" RELAY

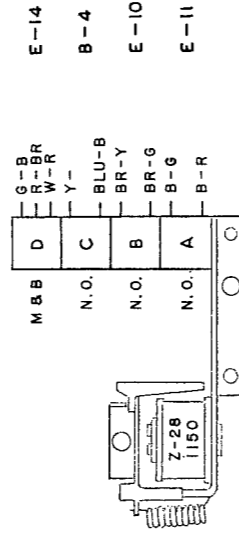
IS ENERGIZED BY LEFT TOP TARGET (INSIDE)---ALSO BY RIGHT TOP OR RIGHT BOTTOM ROLLOVER SWITCH.



OPENS CIRCUIT TO 10 POINT RELAY AND CLOSES TO 100 POINT RELAY.
TO LEFT TOP JET BUMPER LITE.
IN SERIES WITH SWITCH B ON "C" RELAY.
IN HOLD CIRCUIT TO THIS RELAY.

"C" RELAY

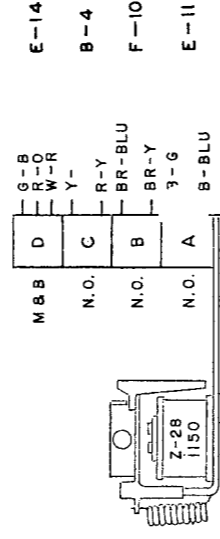
IS ENERGIZED BY RIGHT TOP TARGET (INSIDE)---ALSO BY LEFT SIDE TARGET.



OPENS CIRCUIT TO 10 POINT RELAY AND CLOSES TO 100 POINT RELAY.
TO RIGHT TOP JET BUMPER LITE.
IN SERIES WITH SWITCH B ON "D" RELAY.
IN HOLD CIRCUIT TO THIS RELAY.

"D" RELAY

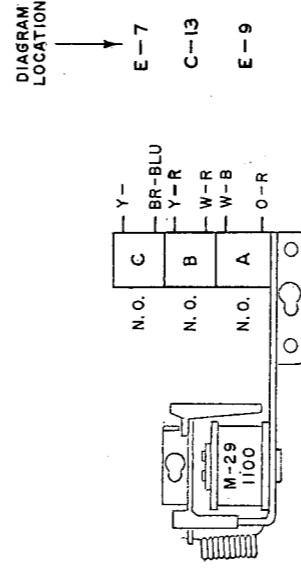
IS ENERGIZED BY RIGHT TOP TARGET (OUTSIDE)---ALSO BY RIGHT SIDE TARGET.



OPENS CIRCUIT TO 10 POINT RELAY AND CLOSES TO 100 POINT RELAY.
TO RIGHT BOTTOM JET BUMPER LITE.
ENERGIZES SET-UP RELAY, THRU SWITCHES ON "A", "B" AND "C" RELAYS.
IN HOLD CIRCUIT TO THIS RELAY.

ADVANCE RELAY

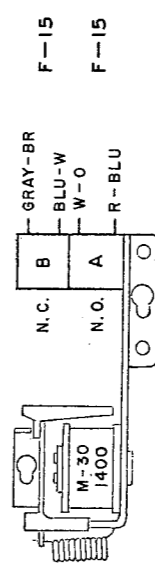
IS ENERGIZED BY NO. 2 BUMPER RELAY, LEFT OR RIGHT TOP ROLLOVER SWITCH, AND ROLLOVER BUTTONS (WHEN LIT).



ENERGIZES ADVANCE UNIT S.U. COIL.
PULSES 100 POINT RELAY.
IN HOLD CIRCUIT TO THIS RELAY.

KICK-OUT RELAY

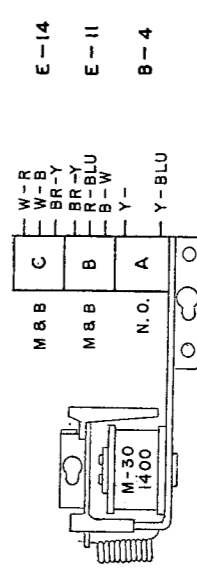
IS ENERGIZED BY KICK-OUT UNIT END-OF-STROKE SWITCH.



OPENS CIRCUIT TO KICK-OUT UNIT LATCH COIL.
IN CIRCUIT TO KICK-OUT UNIT TRIP COIL.

SET UP RELAY

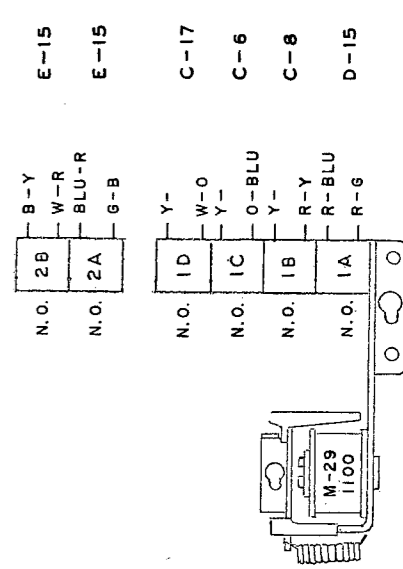
IS ENERGIZED BY "A", "B", "C" AND "D" RELAYS.



OPENS CIRCUIT TO 100 POINT RELAY AND CLOSES TO 1000 POINT RELAY.
ENERGIZES RACE UNIT S.U. COIL, THRU LEFT OR RIGHT BOTTOM ROLLOVER SWITCHES (OUTSIDE).
TO LEFT AND RIGHT BOTTOM ROLLOVER LITES (OUTSIDE). ALSO TO CENTER TARGET LITE.

10 POINT RELAY

IS PULSED BY NO. 1, 3, 4 OR 5 BUMPER RELAY.



PULSES 100 POINT RELAY, THRU 9TH POSITION SWITCH ON 10 POINT DRUM UNIT.
IN HOLD CIRCUIT TO THIS RELAY.

TO SMALL BELL COIL.
PULSES 10 POINT DRUM UNIT COIL.
ENERGIZES BALL INDEX RELAY.
IN SERIES WITH SWITCH A ON KICK-OUT RELAY.

LOCATED IN BACK BOX

100 POINT RELAY

IS PULSED BY NO. 1, 3, 4 OR 5 BUMPER RELAY. ALSO BY ADVANCE RELAY OR CENTER TARGET RELAY.

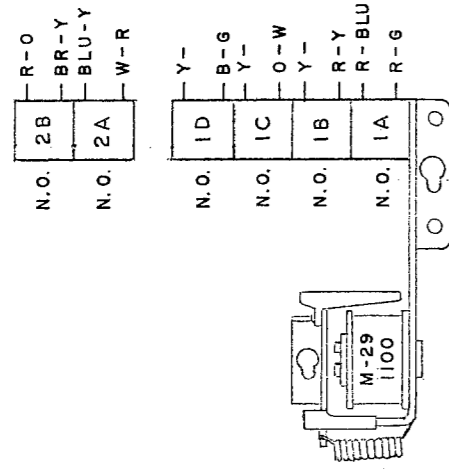


DIAGRAM LOCATION

E-15 PULSES 1000 POINT RELAY, THRU 9TH POSITION SWITCH ON 100 POINT DRUM UNIT.
E-15 IN HOLD CIRCUIT TO THIS RELAY.

C-17 PULSES CHIME COIL.

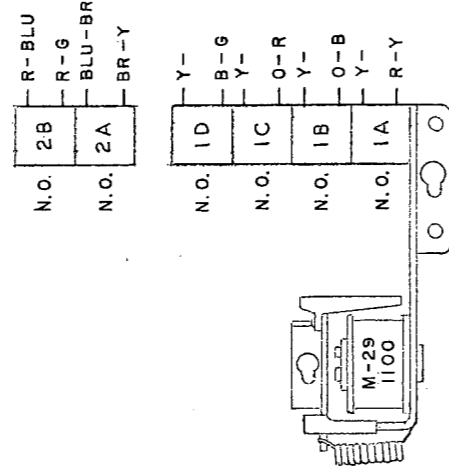
C-7 PULSES 100 POINT DRUM UNIT COIL.

C-8 ENERGIZES BALL INDEX RELAY.

D-15 IN SERIES WITH SWITCH A ON KICK-OUT RELAY.

1000 POINT RELAY

IS PULSED BY LEFT OR RIGHT BOTTOM ROLLOVER SWITCHES---ALSO BY (4) TOP TARGET SWITCHES.



D-15 IN SERIES WITH SWITCH A ON KICK-OUT RELAY.

E-15 IN HOLD CIRCUIT TO THIS RELAY.

C-17 PULSES CHIME COIL.

C-7 PULSES 10,000 POINT DRUM UNIT COIL, THRU 9TH POSITION SWITCH ON 1000 POINT DRUM UNIT.

C-7 PULSES 1000 POINT DRUM UNIT COIL.

C-8 ENERGIZES BALL INDEX RELAY.

NOTES