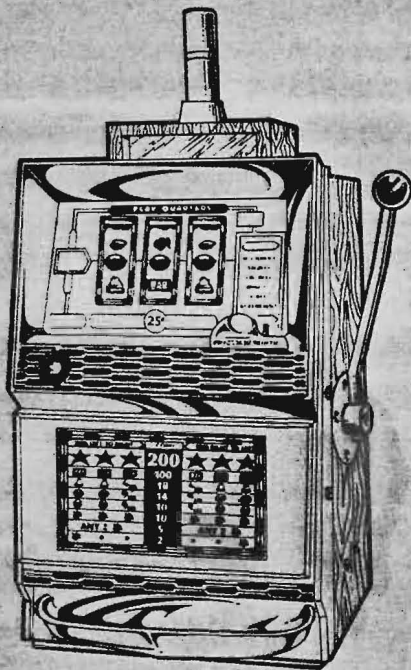


AUTOSLOT MAINTENANCE MANUAL



**SUMMIT
SYSTEMS**

8435 CANOGA AVENUE, CANOGA PARK, CALIFORNIA 91304
TELEPHONE (213) 988-7711, TWX 910-494-1712 (INTERSCI)



The Sugar Shack

Antique

Slot Machines & Juke Boxes

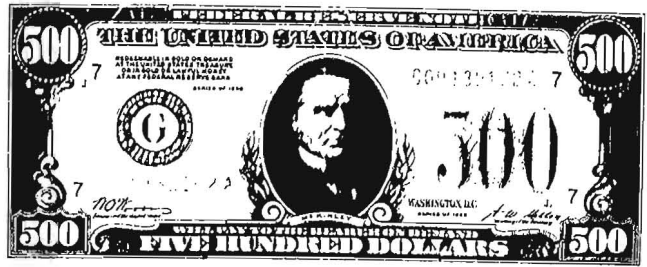
Buy - Sale - Trade

Electro/Mechanical Service, Parts, Repair & Restoration

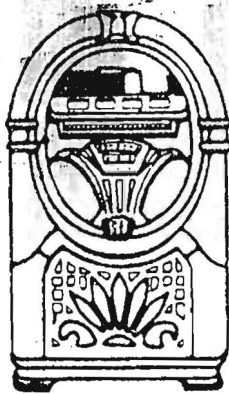
Always Wanted: Old Slot Machines, Juke Boxes,
Trade Stimulators and old Arcade Machines, also any
parts and pieces for old coin operated machines.

Rodger (206) 364-3313
FAX # (206) 364-3313

P.O. Box 55531
Seattle, Washington 98155



PHONE # (206) 364-3313
FAX # (206) 364-3313



PLEASE! POST ON BULLETIN BOARD

The Sugar Shack

Antique

Slot Machines & Juke Boxes

Buy - Sale - Trade

Always Wanted: Old Slot Machines, Juke Boxes,
Trade Stimulators and old Arcade Machines, also any
parts and pieces for old coin operated machines.

Call or write **Rodger** - P.O. Box 55531 - Seattle, Washington - 98155

JUKES & SLOTS
(206) 364-3313
P.O. Box 55531
Seattle, WA 98155

JUKES & SLOTS
(206) 364-3313
P.O. Box 55531
Seattle, WA 98155

JUKES & SLOTS
(206) 364-3313
P.O. Box 55531
Seattle, WA 98155

JUKES & SLOTS
(206) 364-3313
P.O. Box 55531
Seattle, WA 98155

JUKES & SLOTS
(206) 364-3313
P.O. Box 55531
Seattle, WA 98155

JUKES & SLOTS
(206) 364-3313
P.O. Box 55531
Seattle, WA 98155

JUKES & SLOTS
(206) 364-3313
P.O. Box 55531
Seattle, WA 98155

JUKES & SLOTS
(206) 364-3313
P.O. Box 55531
Seattle, WA 98155

JUKES & SLOTS
(206) 364-3313
P.O. Box 55531
Seattle, WA 98155

JUKES & SLOTS
(206) 364-3313
P.O. Box 55531
Seattle, WA 98155

**AUTOSLOT
MAINTENANCE
MANUAL**

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
SECTION I	
GENERAL INFORMATION	3
Major Unit Assemblies	4
Cabinet Assembly	4
Harness	4
Line Filter	5
Fuse Switch Assembly	5
Main Power Toggle Switch	5
AC Line Fuse	6
6 VAC Fuse	6
50 VAC Fuse	6
Power Transformer	7
Line Lights Driver Board	7
Interface Driver PCB	8
Jackpot Bell	8
Door Open Switch	9
Tower Light	10
Key Switch - Jackpot Reset	10
Reel Mechanism Assembly	11
Spin Switch	11
Reel Mechanism Center	12
Power Supply Module	13
Logic Power Switch	14
LED Indicators	14
Hopper Reset Switch	14
Hopper Fill Switch	15
Master Reset Switch	16
Interface Board	16
Slot Controller Board	17
Control Options Board	18
Reel Readers	18
Reel Stop Solenoids	19
Index Disks	20
Reel Mechanism Right Side	20
Door Assembly	21
Reel Glass	21
Feature Glass (High Top)	22
Feature Glass (Low Boys)	22
Award Light Panel	23
Coin Acceptor	23

<u>Title</u>	<u>Page</u>
Coin Lockout	24
Coin-In Switch	24
Insert/Accepted Coin Lights	25
Coins Played Information	25
Coin Diverter	26
Drop-Ramp Switch	26
Win Meter	27
Tilt Light	28
 Hopper Assembly	 28
Hopper Harness	29
Indirect Drive Hopper	29
Direct Drive Motor	30
Coin-Out Switch	30
Hopper Controller Board	31
 Handle Mechanism	 32
Handle Release Coil	32

SECTION II

OPERATING PRINCIPALS	33
Functional Block Diagram of Slot Controller	35
Power Supply	36
Standby (Idle State)	36
Insert Coin Light	37
Coin Lockout	37
Game Initiation	37
Coin-In Switch	38
Maximum Coins	39
Coin Lockout Coil	39
Game Feature	39
Coin Diverter	39
Coin Drop Switch	40
Handle Release Coil	40
Reel Spin Switch	40
Reel Indexing	40
Reel Readers	41
Reel Tilts	41
Reel Stop Solenoids	41
Reel Indexing Tolerance	42
Payout	42
Hopper Motor	42
Coin-Out Switch	42
Coin-Out Problems	43

<u>Title</u>	<u>Page</u>
--------------	-------------

SECTION III

FUNCTIONAL TEST AND TROUBLE-SHOOTING	45
Mandatory Voltage Checks	47
Slot Controller Simulator	49
Functional Checks	51
Reel Stop Solenoids K1, K2, K3, K4, K5	51
Hopper Motor K6, K7	51
Coin Lockout K8	52
Diverter K9	52
Handle Release K10	52
Electromechanical Coin-In Meter K11	53
Tilt Code K12	53
"Jackpot" Bell and Tower Light K13	53
Tilt Light K14	54
Coin Played Lights	54
Coin Lamps K15, K16, K17, K18, K21, K22	54
Coin Accepted K19	55
Insert Coin Light K20	55
"A" and "B" LEDs Reel Readers	55
Reel Spin LED	56
Coin-In Switch LED	56
Coin-Out Switch LED	56
Door Switch LED	57
Key Switch LED	57
Hopper Fill LED	58
Hopper Reset LED	58
Master Reset LED	58
Full Voltage	59
Drop Switch	59
Malfunction Isolation	59
Five Step Quick Check for Problem Isolation	59
Mechanical Malfunction and Adjustments	61
Handle Mechanism	61
Free Handle Pull	61
No Handle Return	62
Handle Return Before Reels Kick-off	62
Reel Mechanism	63
Reels Kick-Off	63
Stop Bracket	63
No Kick-Off One Reel (Crank)	63
No Kick-Off All Reels (Trip Arm)	64
No Kick-Off All Reels (Cylinder)	64
No Kick-Off All Reels (Roll Pin)	64

<u>Title</u>	<u>Page</u>
No Kick-Off All Reels (Drive Shaft)	64
Incorrect Reel Kick-Off/Index	65
Spin Switch	66
Reel Readers	66
 Mechanical Adjustments - Reel Mechanism	 67
Procedures for Adjustment	68
Drive Shaft Adjustment	68
Rest Motion	68
Start Motion	68
Half Gear	68
Stop Bracket Adjustment	70
Start Motion Position Adjustment	70
Trip Position Adjustment	70
Sequence of Mechanical Motion	70
Timing of Reel Mechanism to Handle Mechanism.	73
Air Cylinder	73
Reels	74
Reel Strip Installation Procedure	74
 Hopper Assembly	 76
Coin Roller and Coin-Out Switch	76
Pin Wheel	76
Hopper Knife	77
Coin Kicker	77
Hopper Scoop	78
Coin Wiper	78
Hopper Motor Brake	78

SECTION IV

FAULT LOCATION DIAGRAMS	79
Tilt Code -0-	82
Tilt Code -1-	83
Tilt Code -2-	84
Tilt Code X3-	85
Tilt Code X4-	86
Tilt Code X5-	87
Tilt Code X6-	88
Tilt Code X7-	89
Tilt Code -8-	90
Tilt Code -9-	91
Tilt Code -	92
Tilt Code ---	93
Tilt Code X \sqrt{Y}	94
Tilt Code X $\sqrt{\quad}$ Y	96

<u>Title</u>	<u>Page</u>
--------------	-------------

SECTION V

OPERATION/PERFORMANCE SEQUENCE	99
Sequence of Operation	101
Idle/Stand-By State	101
Game Initiating	101
Maximum Coins Game	102
Handle Pull and Reel Spin	103
Reel Indexing	103
Winning Combination Automatic Payout	104
Winning Combination Hand Payout	105
Jackpot Award Reset	105
Game Security and Exception Codes	105

SECTION VI

COIN CHECK PROCEDURE	107
Deposit Coin Light	109
Coin Accepted Light	109
Coin Path	109
Coin Acceptor	109
Coin Lockout	109
Handle Release	110
Coin Diverter	110
Line Light	110
Handle Pulls	110
When A Win Condition Occurs	110
Coin Exit	110
Win Meter	111

SECTION VII

TILT CODES	113
Code -0-	115
Code -1-	115
Code -2-	115
Code X3-	116
Code X4-	117
Code X5-	117
Code X6-	118
Code X7-	118
Reel Mis-indexing $X_{\bar{N}}$ or $X_{\bar{N}}$	118
Flashing "0" or Digit(s)	120
Tilt Code Solutions λ	121
Power Interruption and Game Data Retention	121
Electronic Internal Meters	122
Meter Identification Codes	124
Hopper Level Variance	124

Title Page

SECTION VIII

Lubrication Guide	127
Handle Mechanism	130
Reel Mechanism	131
Hopper Mechanism	133
Door	134

APPENDIX 1

CIRCUIT DIAGRAMS

APPENDIX 2

SERVICE BULLETINS

SECTION

I

General Information

GENERAL INFORMATION

Autoslot is fundamentally a set of slot machine mechanical components integrated with a microprocessor-based electronic control system.

The differences between traditional electromechanical machines and some other electronically controlled machines, when compared to the Summit Electronic Control, stem from the basic difference in the way the Summit game operates and the way it is packaged. Understanding how the machine operates is the key to maintaining this equipment.

Maintenance activities can be split into two major parts: mechanical and electrical. The Reel Mechanism, Handle Mechanism, and Hopper Assembly are primarily mechanical devices to which electronic interfaces and controls have been applied. These parts must still be maintained as mechanical devices with routine cleaning, lubrication, and replacement of worn parts. The electronic interfaces which connect to the mechanical assemblies have been designed to produce long, adjustment-free life cycles. This aids in reducing maintenance costs.

The electronic assemblies are designed in a modular fashion which aids in fault isolation and trouble diagnosis. In addition, special features have been incorporated into the game Control Program, which monitor the ongoing performance or which aid in the adjustment and maintenance of the mechanical assemblies. To a great extent, the Autoslot tolerates a broader range of mechanical wear than other games and has the ability to detect and report its own errors before revenue performance is impacted. The following sections of this manual explain how this is done and describe how Autoslot aids the maintenance effort.

MAJOR UNIT ASSEMBLIES

Autoslot is divided into the following major components:

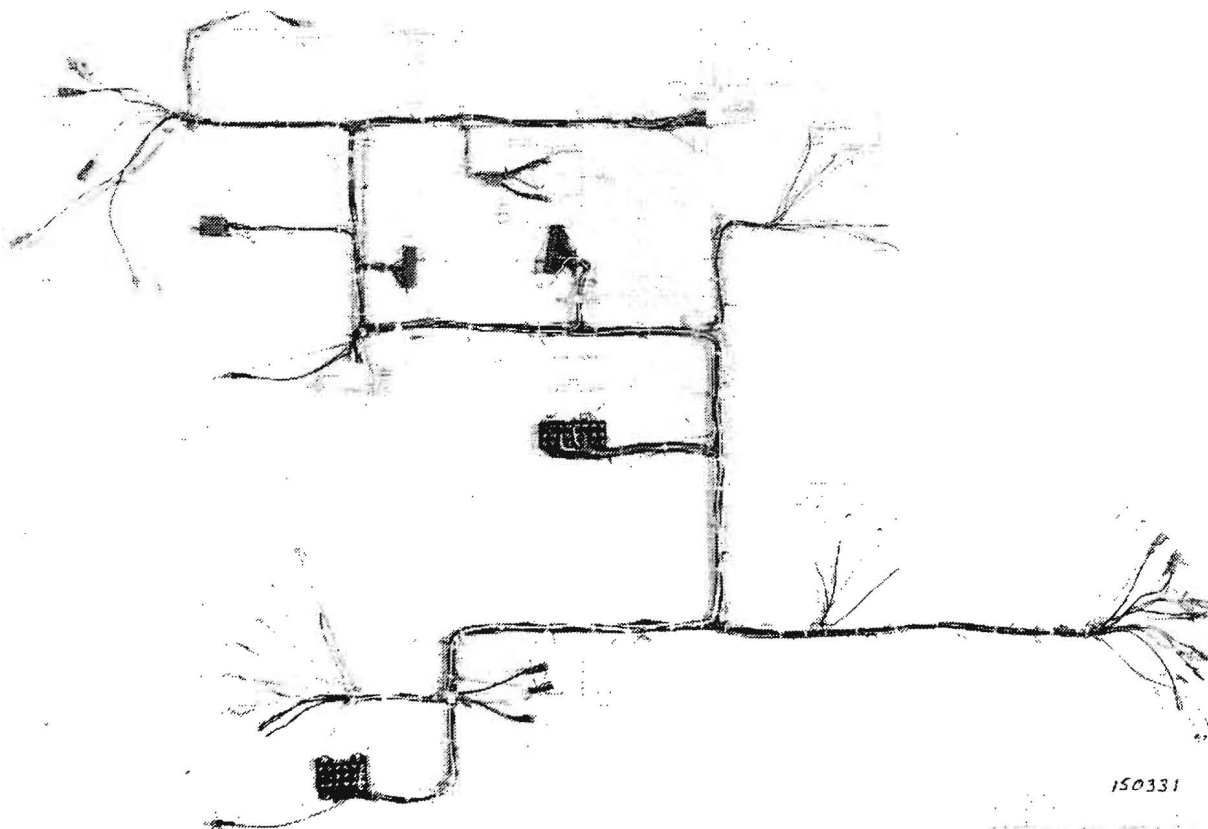
- A. Cabinet Assembly
- B. Reel Mechanism Assembly
- C. Door Assembly
- D. Hopper Assembly
- E. Handle Mechanism Assembly

CABINET ASSEMBLY

Harness

The Harness (wiring and printed circuits) is the "nerve system" of the slot machine and is essential to the machine's proper functioning. It transfers mandatory information to and from different locations, bringing back to the Slot Controller signals for logical conclusions and subsequent actions.

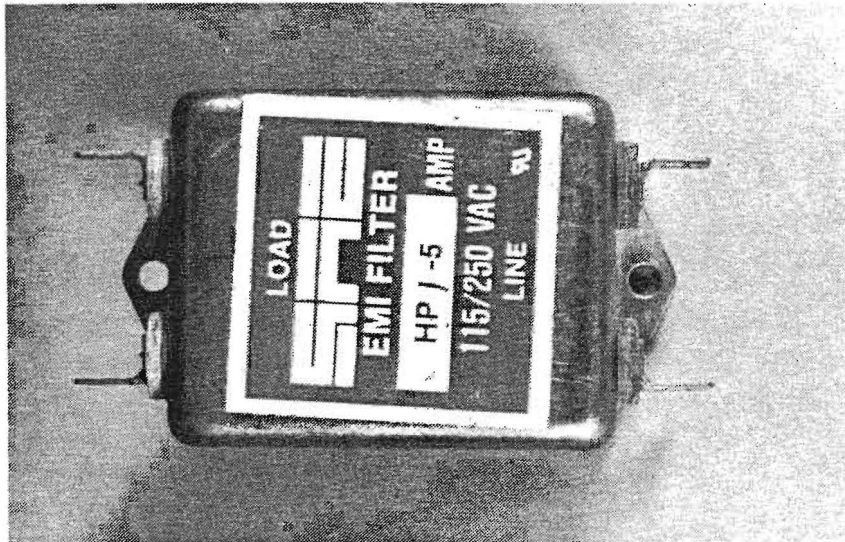
One Harness is interchangeable within cabinets of the same size, regardless of the model and denomination of the slot machine.



Line Filter

The Line Filter is fastened to the back wall of the lower cabinet. The Line Filter prevents spurious line voltages from entering the slot machine.

The slot machine has to be plugged into a 3-wire grounded outlet.



FUSE SWITCH ASSEMBLY

Main Power Toggle Switch

The main on/off Power Toggle Switch is secured to the front lower right-hand wall of the cabinet and is mounted on a bracket. It applies primary power to the machine.

The main Power Switch should be in the off position whenever the Reel Mechanism, Hopper Assembly, or any electronic assembly is removed or replaced.



AC Line Fuse

The Fuse Holders are fastened on the same bracket next to the main Power Switch.

Fuse Assemblies are removable/replaceable components and are identified on the mount bracket.

The electrical power for the machine's operation is applied through the 115 VAC Fuse which is rated at 5 Amps (230 VAC uses a 3 Amp fuse).

6 VAC Fuse

Another Fuse located adjacent to the Line Fuse, passes 6 VAC to the incandescent light bulbs to illuminate information about game status and for general illumination of the slot machine. The 6 VAC fuse is rated at 15 Amps.

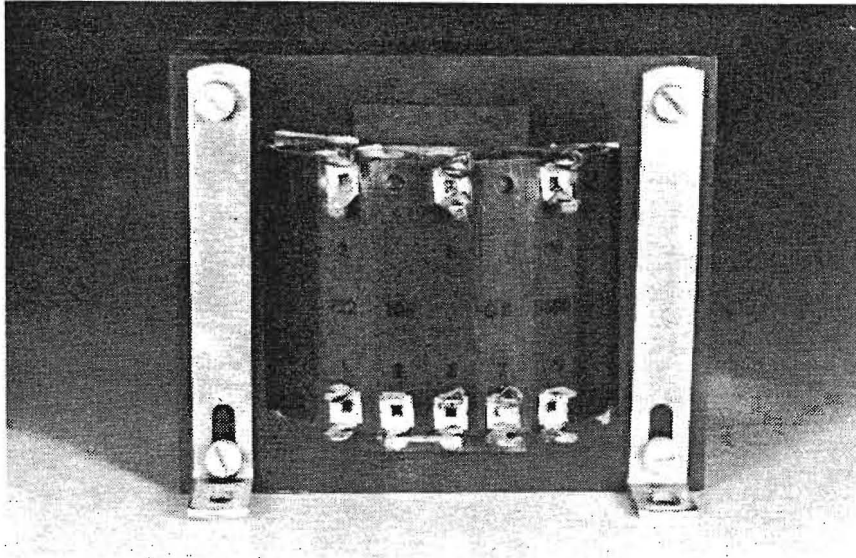
50 VAC Fuse

Another fuse located adjacent to the AC Line and 6 VAC fuses passes 50 VAC to the interface card for operation of coin lockout, coin diverter, handle release, etc. This 50 Volt AC fuse is rated at 2 Amps.

Power Transformer

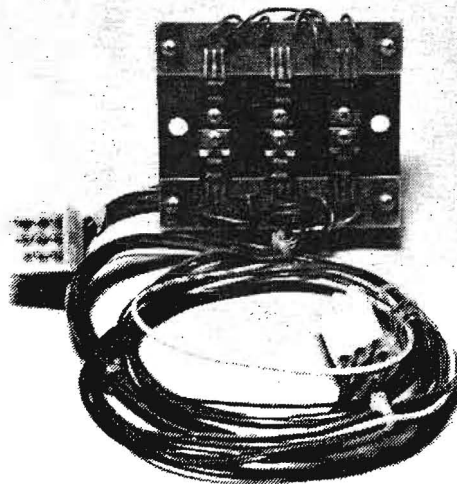
The Power Transformer is bolted to the back wall of the lower cabinet.

It is used for isolation and to step down the voltage when the machine is connected to the 110/220 VAC line for powering 6 VAC and 50 VAC circuits.



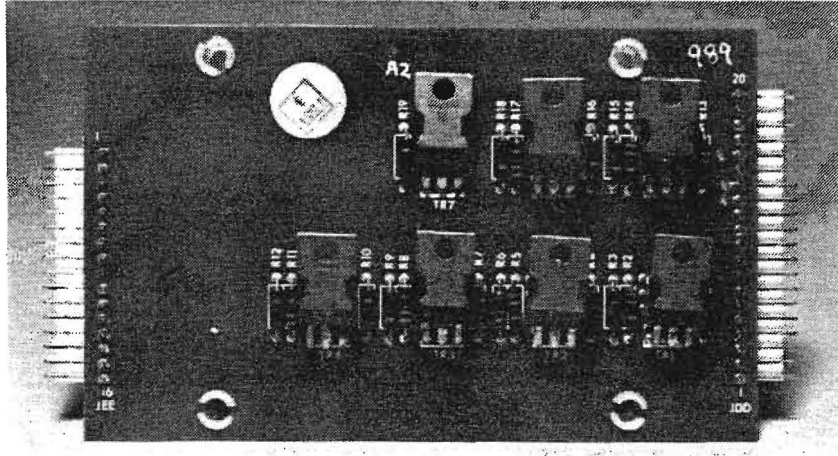
Line Lights Driver Board

The Line Lights Driver Board (also called Display Driver Board) is fastened to the left wall of the Reel Mechanism compartment.



Interface Driver PCB

The Interface Driver PCB Assembly is available in a number of different configurations. Its function is to provide for conversion and generation of signals to equipment which is external to the slot machine, such as a Link or Progressive game display. This assembly, when installed, is mounted at the rear of the upper cabinet behind the reel mechanism.



Jackpot Bell

The Jackpot Bell is usually located on the back wall of the Reel Mechanism compartment. This Bell is energized through 6 VAC control circuits. Bell ringing is optional and is arranged to sound under a number of conditions, such as coin-in or to announce large awards. Bell sounding is normally controlled by internal machine programming.



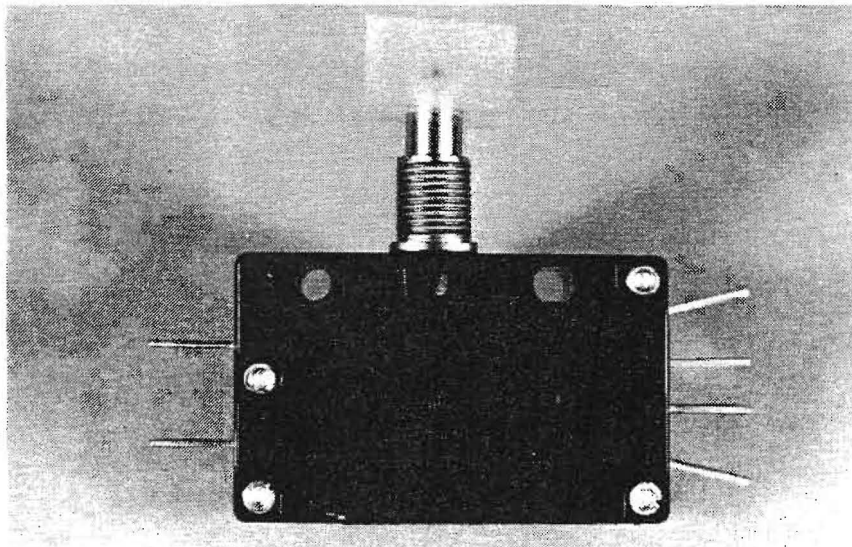
Door Open Switch

This is a dual-purpose switch and is located behind the upper door hinge.

Its purpose is to close the circuit to the tower-light door-open light bulb, to signal that the slot machine door has been opened, informing management and security for possible action.

The second function of the Door Open Switch is to inform the Slot Controller that the door has been opened. This conditions the program to suspend counting of coin-in, handle pull, and coin-drop events, for example. Test games may be played while the machine door is open.

This switch is also used to inform the Slot Controller to resume a payout in case there was an incomplete last winning combination payout. The door must be closed for resumption of a payout so that the coin-out meter can be incremented accordingly.



Tower Light (Candle)

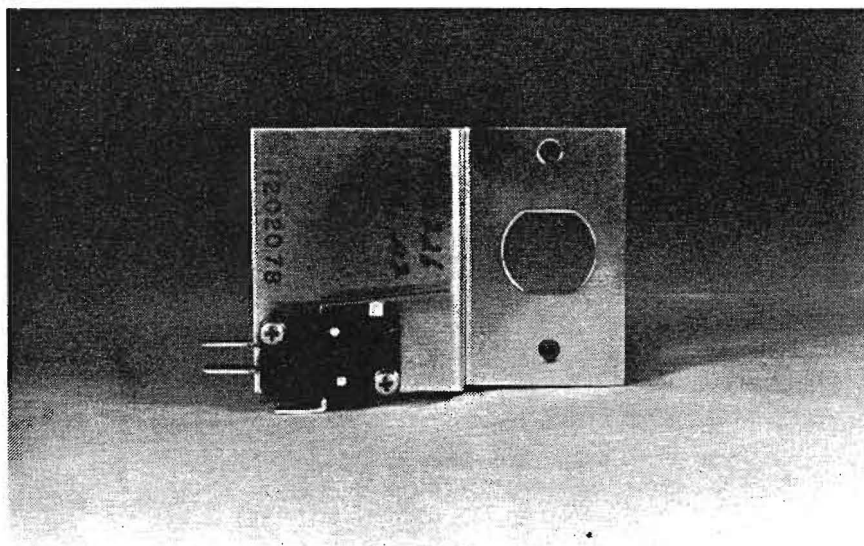
The purpose of the Tower Light is to visually inform management personnel or slot attendants about possible machine tampering, open slot machine door, tilts, automatic or hand-pay jackpots, and player calls for assistance.

Key Switch - Jackpot Reset

This Key Switch is located below the Handle Mechanism. Its purpose is to inform the Slot Controller:

- a. That a hand-pay winning combination jackpot has been paid and to reset the slot machine for a new game.
- b. A request for display of internal meters accumulation (totals of coins in, coins out, coins to drop box, handle pulls, hand-paid jackpots, and hopper level).
- c. Other special game functions such as external tilt reset or enabling machine pay-out in special game configurations.

Coin accounting is defined in more detail in Section VII.

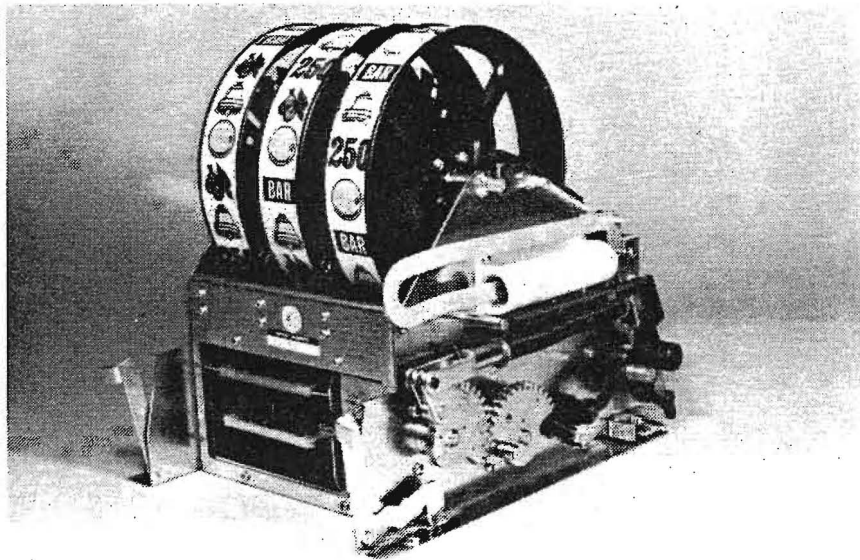


REEL MECHANISM ASSEMBLY

The Reel Mechanism houses the majority of the electronic control components used by the game. This provides much easier access for maintenance and service. When compared to a Reel Mechanism from an electromechanical game, there are fewer components used, which contributes directly to reliability and which also makes the game virtually tamper-proof.

In order to provide convenient servicing, the main controls are housed in the front of the middle of the Reel Mechanism (card cage).

The major electronic modules are plug-in type and use shock absorbent anti-vibration slides.



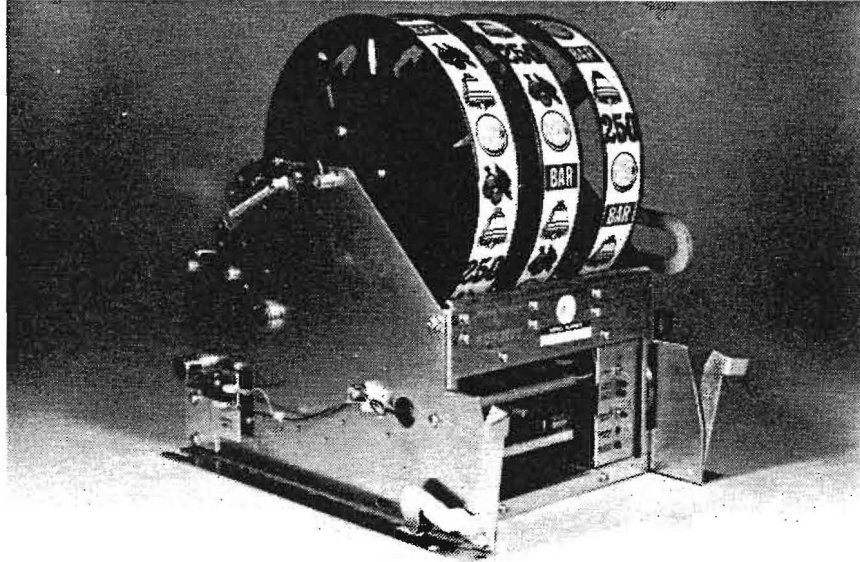
REEL MECHANISM LEFT SIDE

Spin Switch

The Spin Switch is fastened to the back of the left plate and is actuated by a return motion of the crank (trip shaft), using an extended roll pin as the switch actuator.

The purpose of the Spin Switch is to inform the Slot Controller that the reels kicked for a game.

With this information, the microprocessor opens a circuit through the Interface Assembly to the Coin Lockout Coil and the Insert coin and Coin Accepted light circuits.

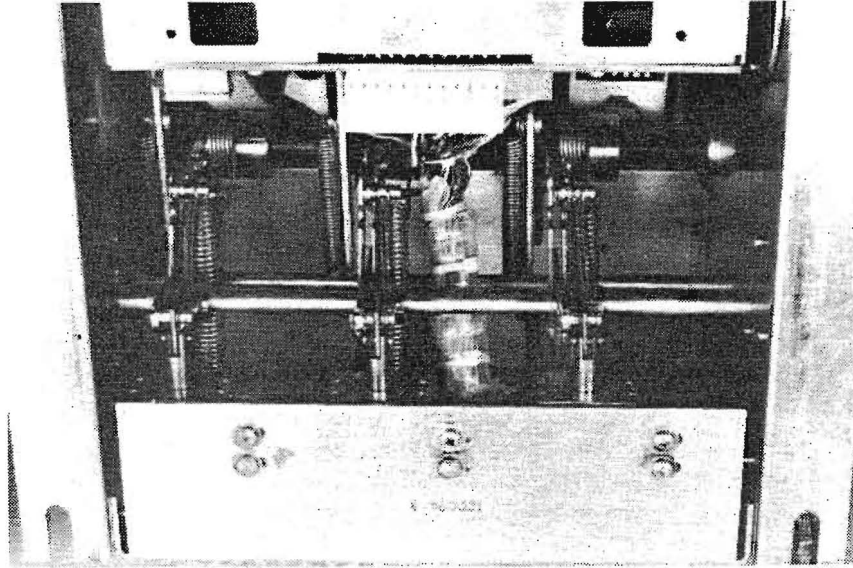


REEL MECHANISM CENTER

The timer shaft timer links and springs found in typical electro-mechanical games have been removed because they are not used by the Autoslot. This space is utilized for the installation of the electronics card cage.

The timing of reel spin is performed electronically and is mathematically unpredictable. Reel stopping is random, and the reel stop positions are selected before the reels are stopped. This is the major difference between the Autoslot game and other games. Since the game is played internally in the memory of the microprocessor on the Slot Controller Board, it cannot be influenced or be changed by moving the reels to some winning reel symbol combination or slowing or speeding up the spin. If the reels are moved or caused to stop in some position other than selected by the microprocessor, the microprocessor program detects this and reports it as a problem using a display code on the Win Meter. The game cannot be made to payout falsely.

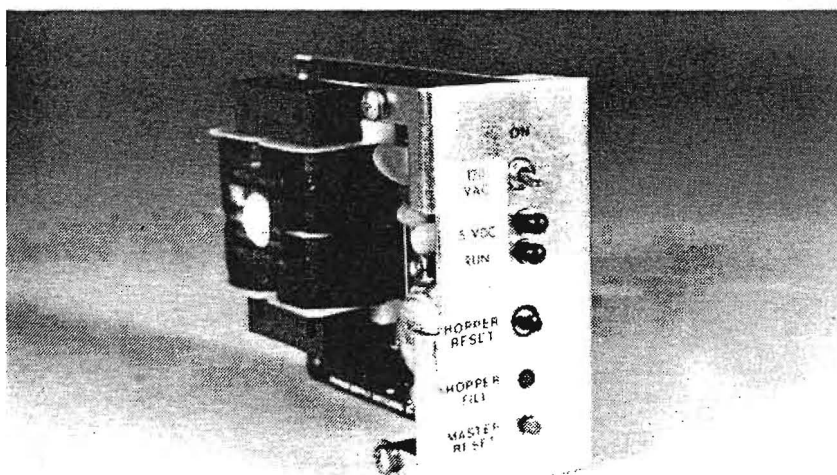
The indexing functions are performed by the Reel Stop Solenoids which are actuated in sequence (momentarily energize) to stop each reel. This is controlled by the Slot Controller sending signals through the Interface Board control circuits.



Power Supply Module

This module is located at the right side of the electronics card cage.

The Power Supply Module is interchangeable and can be used in all Summit models regardless of the type of machine. It contains indicators and switches for control of the machine functions.



Logic Power Switch

The switch is marked "120 VAC" and supplies power to the electronic logic circuits when in the "on" position. This switch may be omitted in some models, in which case the main line power on/off switch serves to disconnect power from the electronic logic.

LED Indicators

There are two red LED (Light Emitting Diode) Indicators located below the Power Toggle Switch.

On early model Power Supplies, one is marked "Lamp Power" and the other "Logic Power." These are used to identify power-on conditions in the Power Supply Module. In normal operation, both Indicators are illuminated.

On later model Power Supplies, the Logic Power LED is illuminated when both Logic and Lamp DC power are within regulation limits. The second LED is labeled "RUN" and indicates the status of the logic reset circuit. When this LED is extinguished, the logic is in reset mode. When the Run LED is illuminated, the electronics are operating. Conditions where the Logic Power LED is on and the Run LED is off may be observed under extreme AC Power brown-out conditions and briefly following switching on power.

Hopper Reset Switch

The Hopper Reset Switch is located on the front of the Power Supply Module below the LED Indicators.

Its purpose, when depressed, is to cause the hopper to resume payout after clearing any type of hopper coin jam. In this case, the Hopper Reset Switch works in conjunction with the slot machine Door Switch.

A hopper jam or empty condition is detected by a time-out condition sensed by the Slot Controller. The time-out period is variable and is selected according to the type of hopper mechanism (typically five seconds). If the hopper fails to deliver a coin within this period of time, the hopper motor is stopped by the control electronics; intervention is required to restart the hopper. The Hopper Reset Switch is also used to provide reset/exit of certain tilt conditions. (See Section VII.)

Hopper Fill Switch

The Hopper Fill Switch is located on the front of the Power Supply Module underneath the Hopper Reset Switch.

The Hopper Fill Switch has a dual function. The primary one is to inform the Slot Controller that a hopper fill was made following an empty hopper time-out.

The Slot Controller will accept operation of the Fill Switch as valid only after hopper time-out. A hopper time-out occurs after a period of time (usually five seconds) if there were no coins recorded coming out. Payout is resumed after:

- a. filling hopper with coins,
- b. depressing Hopper Fill Switch, and
- c. closing the slot machine door.

The secondary purpose of the Hopper Fill Switch is to facilitate checking the reel readers for correct adjustment.

By depressing the Hopper Fill Switch once, the "Win Meter" will display 1-0, 1-1, 1-2, or 1-3, depending on the actual stop of the reel-1 index wheel. By

depressing once more, the "Win Meter" will display 2-0, 2-1, 2-2, 2-3, depending on the actual stop of the reel-2 index wheel (reel), etc.; this process is repeated for each reel.

To terminate checking, Master Reset Switch is depressed and machine is ready for play. Refer to Service Information Bulletin #004A.

Master Reset Switch

The Master Reset Switch is located on the Power Supply Module beneath the Hopper Fill Switch.

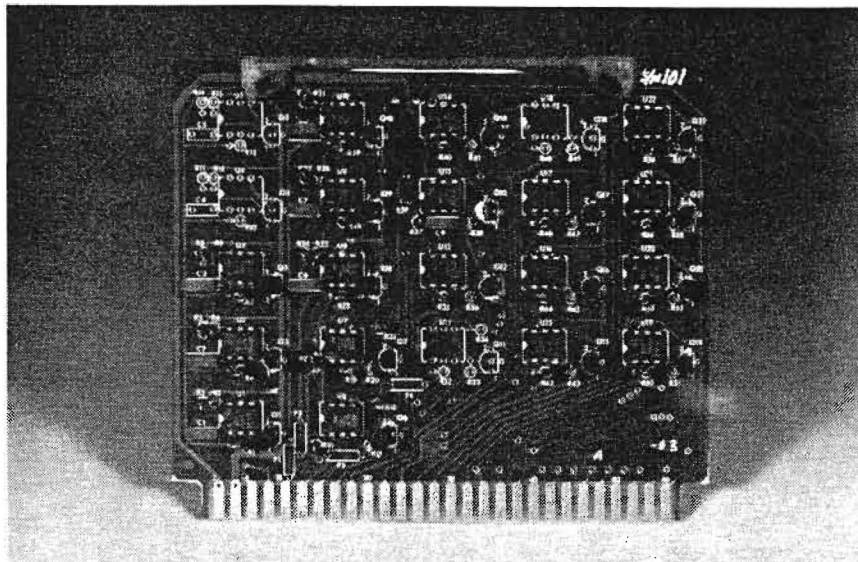
Its purpose is to clear certain tilt conditions displayed on the Win Meter. It is also used to interrupt or reset the Slot Controller during display of the electronic meters (RAM counters), or during Reel Reader tests to initialize the Slot Controller for normal play. The Master Reset Switch will not clear a game in progress; the game must be completed.

Interface Board (Orange Handle)

The Interface Board is located horizontally in the shock absorbent slides in the upper-most position of the electronics card cage.

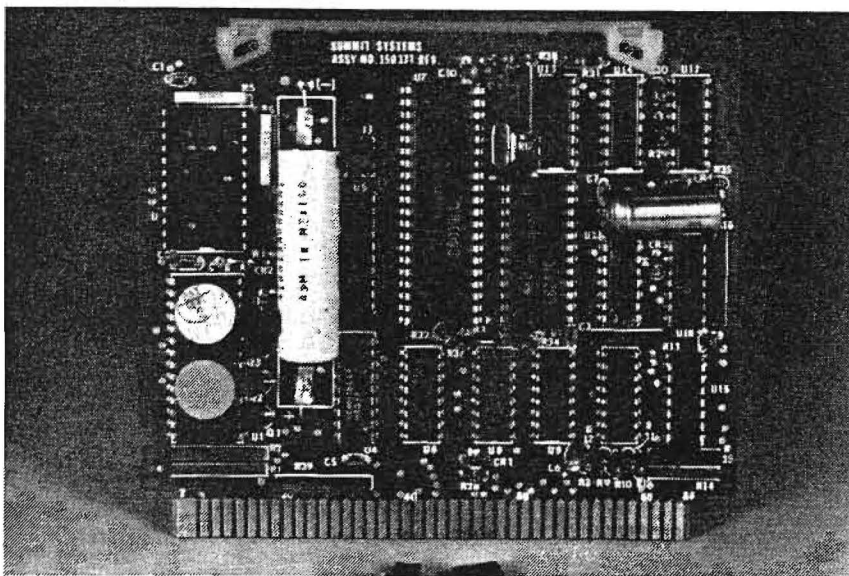
The purpose of the Interface Board is to effect interfacing 5 VDC logic level signals to the 6, 50, and 115 VAC circuits used to control the game operation.

There are 22 different control circuits utilized for three different types of control functions Snubber Networks are provided for inductive loads.



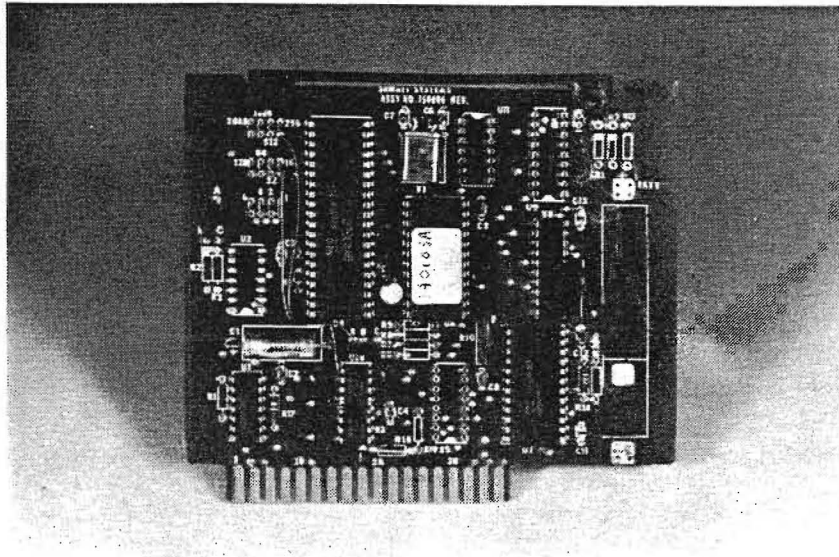
Slot Controller Board (Yellow Handle)

The Slot Controller card is located horizontally in the shock absorbent slides underneath the Interface Board. The Slot Controller Board provides the intelligence for the slot machine. Every action, movement, and outcome within the slot machine has to be initiated and confirmed by the microprocessor and its associated circuitry, which are part of the Slot Controller Assembly. The Slot Controller Board is interchangeable and can be used in all models of the game with the exception of the program EPROM, which distinguishes the model and type of a game (machine) and must be removed and reinstalled when the Slot Controller is replaced or exchanged.



Control Options Board (Blue Handle)

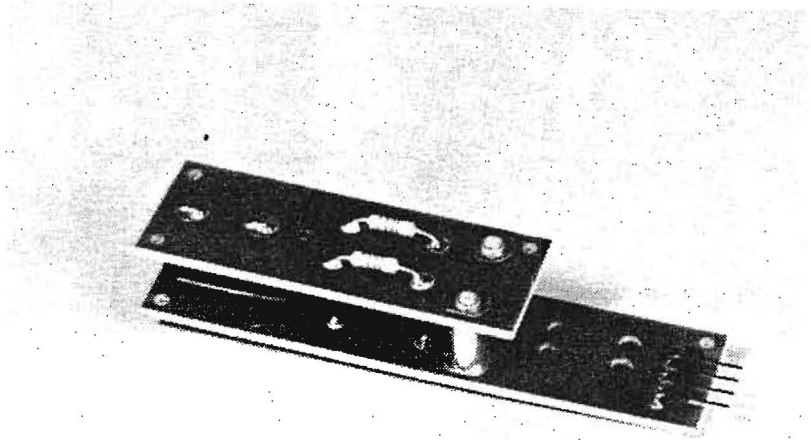
The Control Options Board performs various optional functions as required for a particular environment. Options include switch selectable game parameters or communication of game data to a central computer.



Reel Readers

The Reel Readers are located above the electronics card cage fastened to the inside of Reel Mechanism's front plate and positioned toward the reel shaft. The purpose of the Reel Readers is to permit the microprocessor to monitor the reel's motion and indexing.

Signals from the Reel Readers are interpreted by the microprocessor program as reel positions. This occurs while the reels are spinning so that stopping of the reels at positions selected by the game random-reel-stop generator can be effected.



Reel Stop Solenoids

Reel Stop Solenoids are located on the back plate of the Reel Mechanism Assembly. The purpose of the Reel Stop Solenoids is to physically stop spinning (i.e., cause indexing) of the reels. There is one solenoid for each reel.

The firing of an individual solenoid to stop the spinning of a reel occurs in advance of the intended stop position, depending on the speed of the reel.

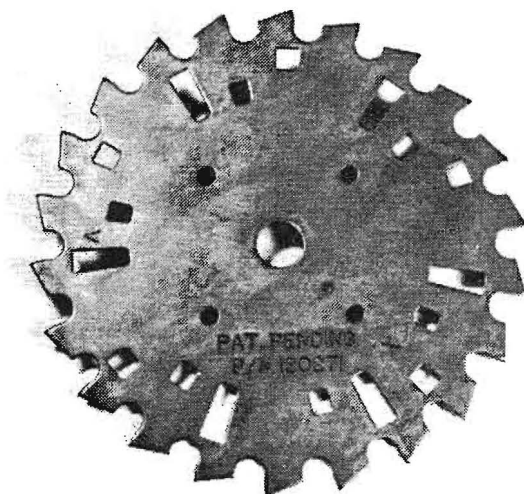


Index Disks

Index disks are secured to the left of the ball bearing hub of each reel.

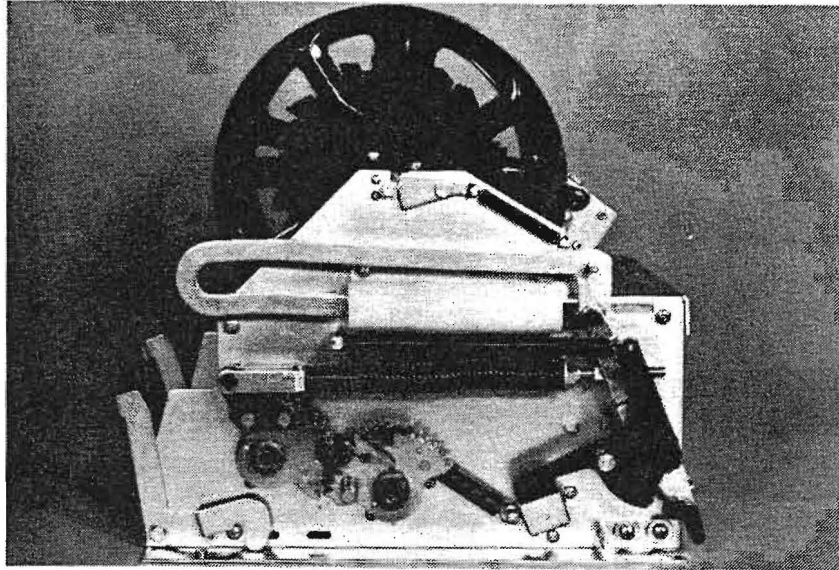
Each reel is equipped with an identical Index Disk. However, there are different disks for 20-, 22-, and 25-stop slot machines. The sawtooth shape of the Index Disk contributes to correct indexing.

Rectangular-shaped holes of different sizes and locations in the reel disk provide a form of binary readout for the reel readers, identifying reel positions to the microprocessor.



REEL MECHANISM RIGHT SIDE

On the right side of the Reel Mechanism there are only mechanical parts. Their purpose is to effect reel kick-off, interconnecting the Handle Mechanism to the Reel Mechanism mechanical kick-off assemblies. These units are covered in detail in other sections of this manual.

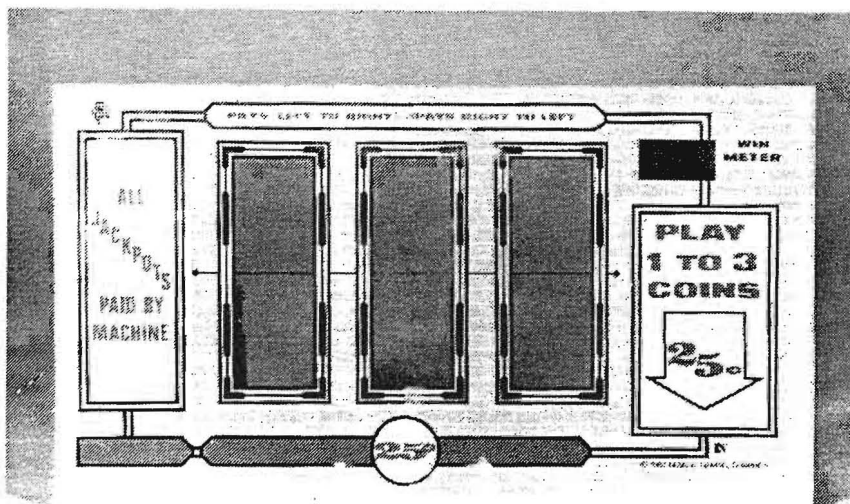


DOOR ASSEMBLY

Reel Glass

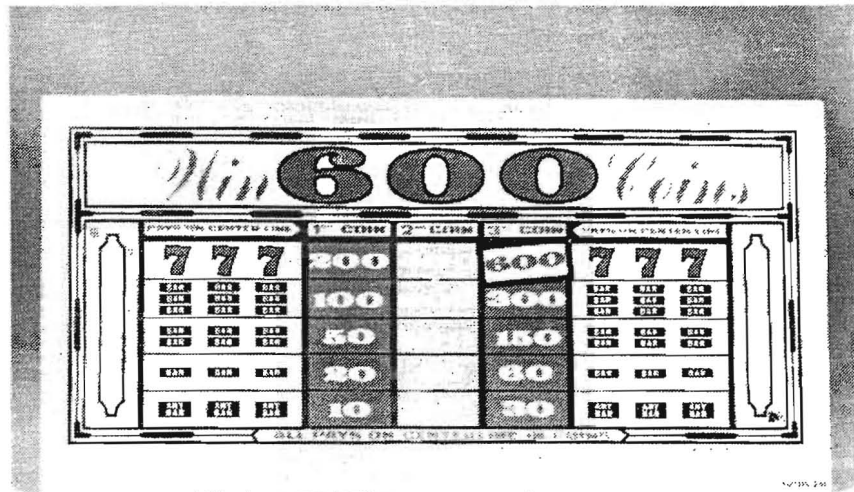
The Reel Glass is located on the upper part of the inside of the door frame. The Reel Glass protects the internal parts of the slot machine entry of dirt and other foreign matter and from tampering, yet allows visibility of the reel spin and symbols in clusters of three through "reel windows" after they physically come to stopped positions.

There are other displays on the Reel Glass which indicate conditions of a game: Insert (deposit) Coin, Coin Accepted, Tilt, coin denomination, number of coins paid by machine automatically, jackpots (hand paid amounts), indications of the number of deposited coins, etc. - depending on the model and type of machine.



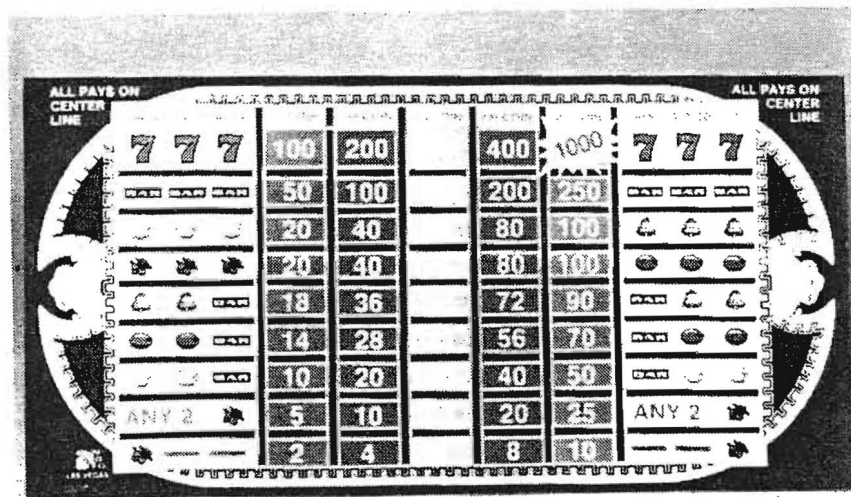
Feature Glass (High Tops)

The Feature Glass unit is located above the Reel Mechanism compartment and performs various functions related to the number of coins played, payout odds, jackpot recordings, effecting of multiple payouts, etc. In order to preserve the aesthetic look of these models, Autoslot retains the same physical size as a cabinet utilizing similar Feature Glass on which winning combination awards are displayed. Some models use the Feature Glass to display only the highest winning awards as an "eye catcher."



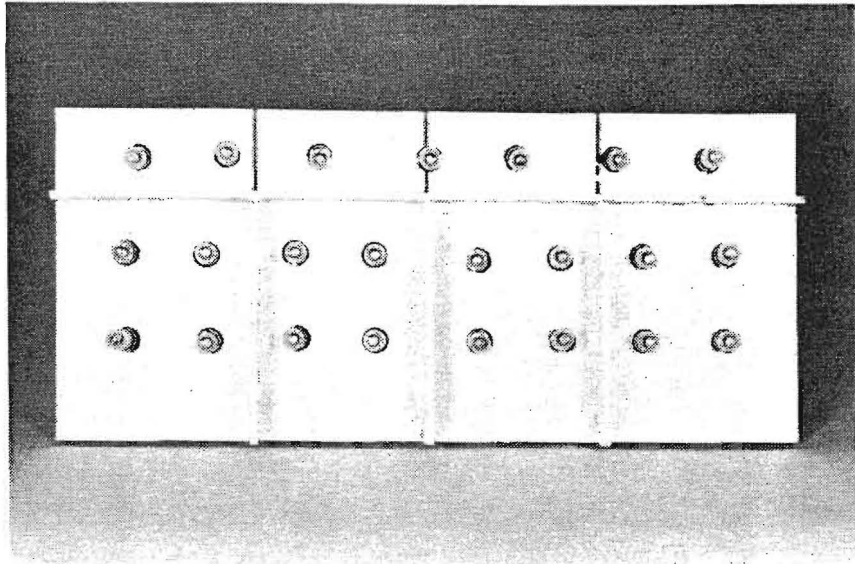
Feature Glass (Low Boys)

"Low Boy" machines have the Feature Glass display installed in the door assembly beneath the Reel Glass with the same or similar information as the High Top.



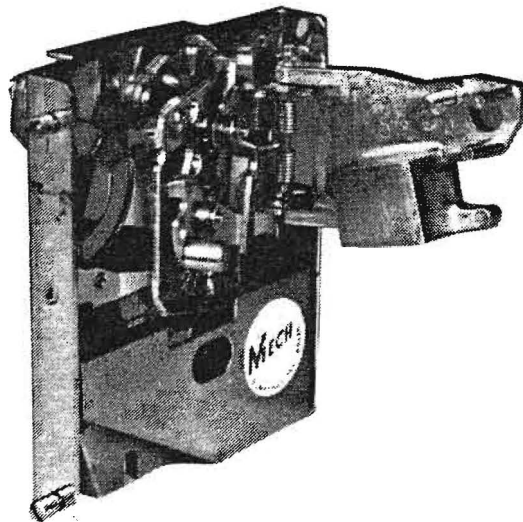
Award Light Panel - Low and High Top

The Award Light Panel is located behind the Feature Glass. Its purpose is to illuminate the Feature Glass, accentuating winning awards. This enables the player to know the number of coins accepted by the machine with possible payout odds per coin inserted.



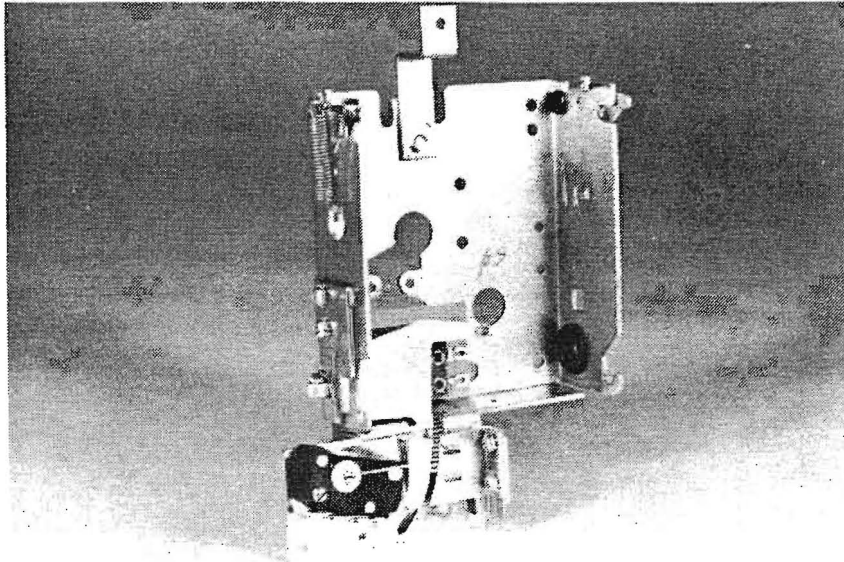
Coin Acceptor

The Coin Acceptor is located in the coin-in track. Its purpose is to accept and validate coins deposited into the machine. All invalid coins for a particular denomination are rejected together with any slugs; for this reason, the Coin Acceptor is also called the "slug rejector." Autoslot machines can be equipped with either a mechanical coin acceptor or an electronic device without modification.



Coin Lockout

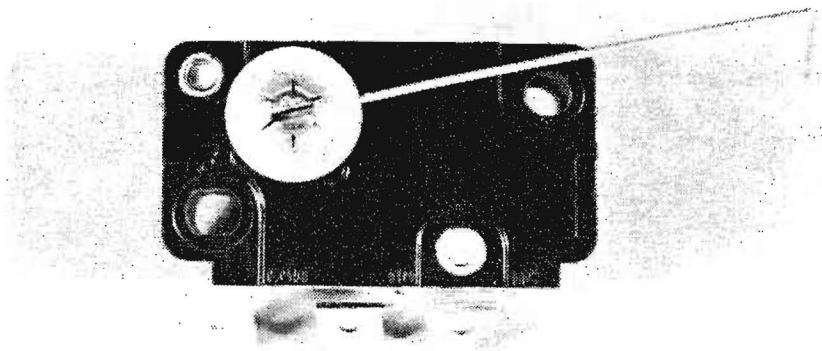
Coin Lockout is located behind the Coin Acceptor. The purpose of Coin Lockout is to allow coins into the machine and reject them after depositing the maximum number of coins per game. Coins are also rejected during spin of reels, automatic payout, hand pay jackpot and machine malfunctions.



Coin-In Switch

The Coin-In Switch is located below the Coin Acceptor. Its purpose is to inform the Slot Controller that the deposited coin(s) is to be credited for a game.

The Coin-In Switch also informs the Slot Controller about a possible coin jam or coin-in tampering, in which case the game becomes void (tilted) until reset by a slot machine attendant. Tilt codes are discussed in a later section.



Insert/Accepted Coin Lights

This information is usually displayed horizontally on the lower part of the Reel Glass below the reel windows.

As the names imply, they are rather self-explanatory. More about the sequence of on/off conditions will appear later in this manual.

Coins Played Information

Coins deposited by a player are registered (if valid), and the player is informed by illuminating corresponding pay lines (line machines) or pay columns (multiplier type machines).

On the left side of the Reel Glass, line machines can have 1st, 2nd, 3rd, 4th, or 5th pay line boxes which are illuminated after valid coins are acknowledged by the Slot Controller.

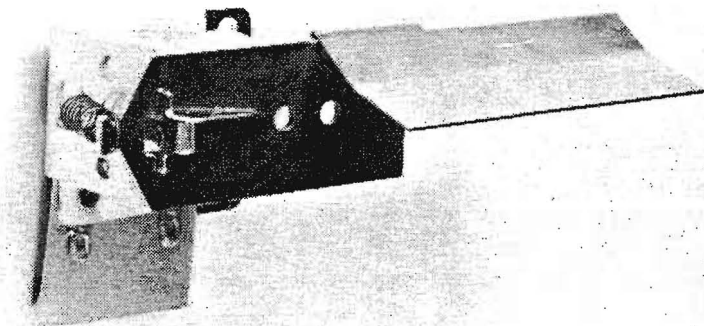
These pay lines are similar to the ones of the Award Light Panel and have essentially the same function.

Coin Diverter

The Coin Diverter is located below the Coin-In Switch. Its purpose, as the name implies, is to divert (direct) coins into the hopper scoop or to the drop box.

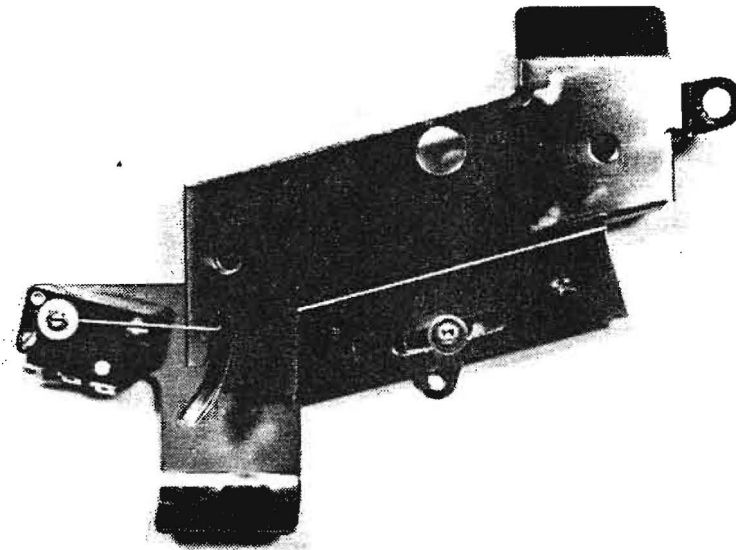
The number of coins in the hopper is controlled electronically by the Slot Controller, which knows at all times the exact number of coins in the hopper scoop. The Coin Diverter is energized to direct coins into the hopper.

When the specified number of coins in the hopper scoop is at its maximum, the Slot Controller de-energizes the Coin Diverter, directing coins to the drop box.



Drop-Ramp Switch (Coin Drop)

The Drop-Ramp Switch is located at the end of the drop slide on the bottom left corner of the slot machine's door. This switch verifies that the coins which are directed to the drop box actually flow to the drop and are counted.



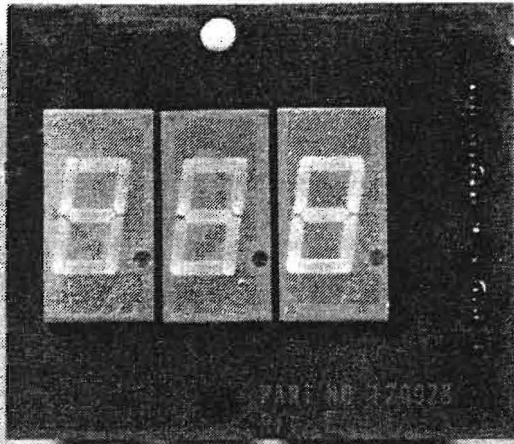
Win Meter (Three-Digit Display)

There is a "window" on the Reel Glass located on the upper right or lower left (depending on model) through which can be observed three seven-segment LED's used to display three-digit numeric values.

The purpose of the Win Meter is to inform a player of the number of coins paid out automatically on any winning combination.

The same three-digit display is also used for display of the internal electronic coin and play count meters. The internal meters include coin-in, coin-out, coin-drop, handle pulls, hand paid jackpots, hopper level variance, and amount of coins in the hopper. This information can be requested whenever the machine is in the idle state. This is accomplished by actuating the Jackpot Key Switch located on the right hand side of the cabinet below the handle without opening the door.

The Win Meter is also used to inform a player/slot employee about any tilt condition or machine malfunction by displaying a tilt or error code. Refer to tilt codes in section VII.



Tilt Light

The Tilt Light is usually located on the bottom left side of the Reel Glass. When the Tilt Light comes on, the game is voided.

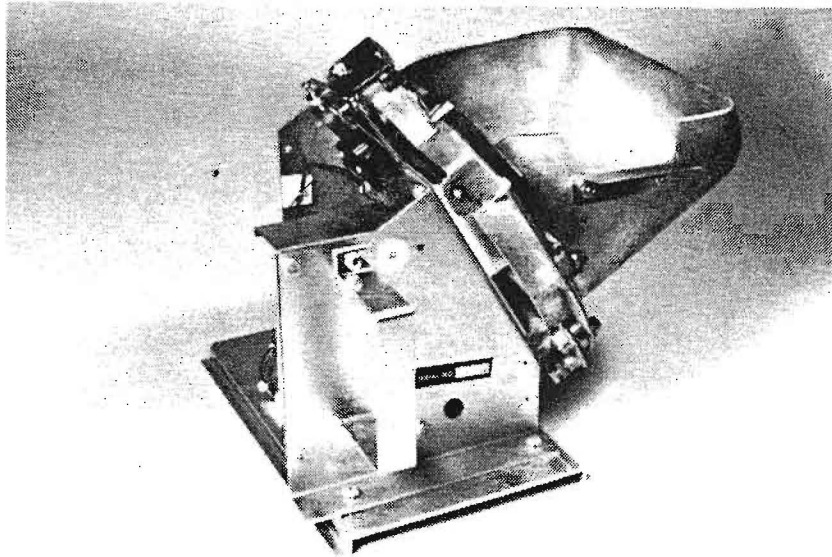
The Tilt Light comes on automatically when a Coin-In Switch or Coin-Out Switch is held activated by a coin for a longer time than designed. The Tilt Light also comes on for a problem associated with the Hopper or Reel Mechanism Assembly.

It is usual practice to illuminate the Tower Light on tilt situations to inform management personnel and slot employees whenever the tilt code is displayed or whenever the machine door is opened.

HOPPER ASSEMBLY

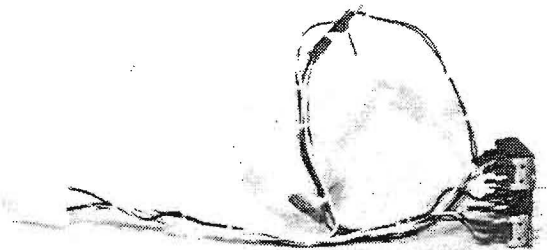
The Hopper Mechanism is located in the lower compartment of the slot machine cabinet.

Mechanically, the Hopper Assembly remains unchanged. A printed circuit board assembly containing the Hopper Control electronics is added.



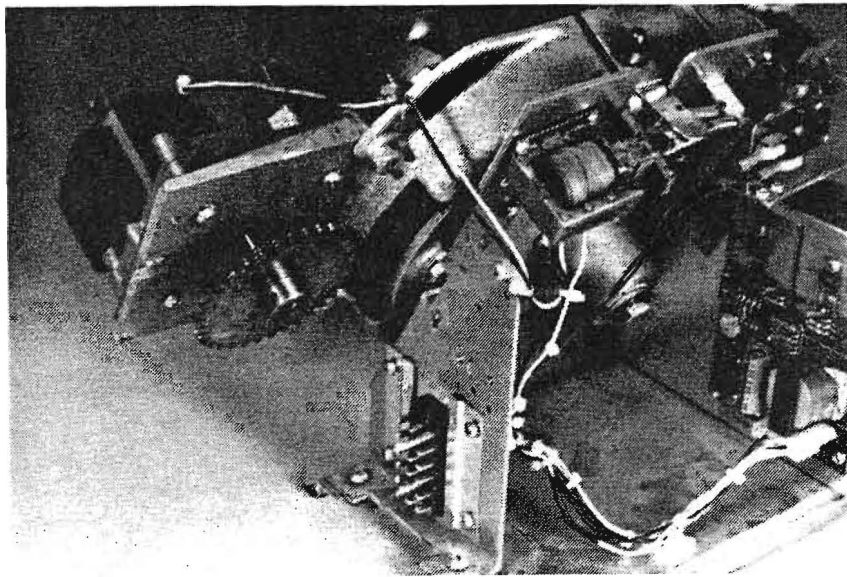
Hopper Harness

There are a minimum of eight wires employed in the Hopper Harness: two for the Coin-Out Switch sensing and six to the Hopper Controller Board.



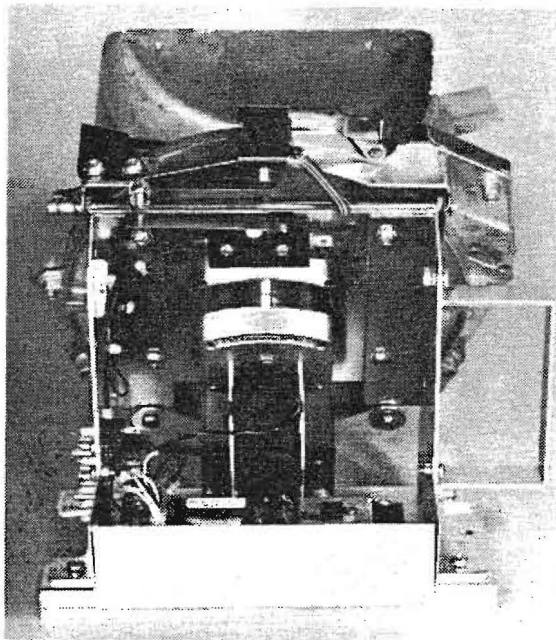
Indirect Drive Hopper

The Indirect Drive Hopper is the type which has the drive motor located behind the hopper scoop mounted on the housing support. The disc assembly (pin wheel) is turned by three driving gears. The motor is energized through the Hopper Controller Board and utilizes a solenoid activated diverter-knife assembly to control coin flow.



Direct Drive Motor

The Direct Drive Hopper Motor is located centrally to the left of the pin wheel mounted on the wheel housing. The Direct Drive Motor provides improved run performance over earlier models. It is energized through the Hopper Controller Board and utilizes a magnetic activated brake device on the motor armature to control coin flow.

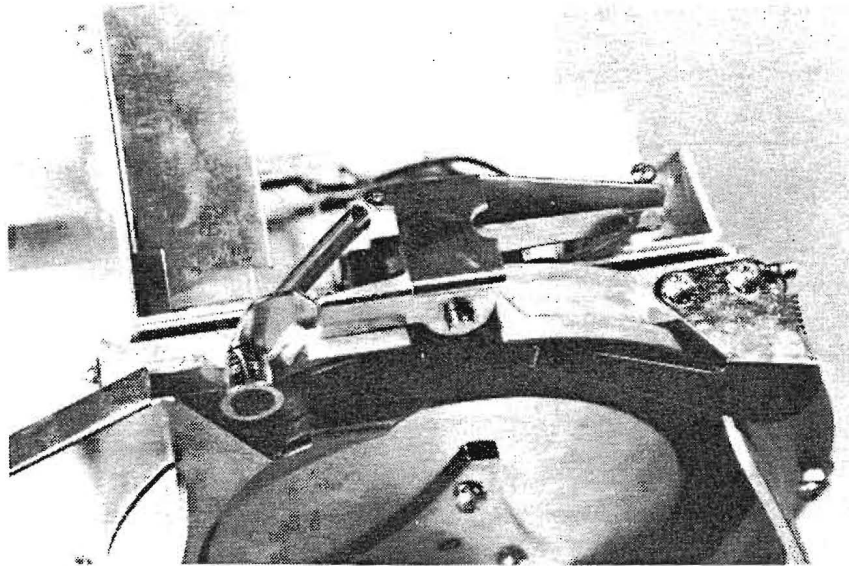


Coin-Out Switch

The Coin-Out Switch is located at the top of the hopper housing (casting).

The purpose of the Coin-Out Switch is to inform the Slot Controller about coins automatically dispensed from the hopper scoop into the coin tray.

The Coin-Out Switch also informs the Slot Controller about possible tampering at the coin exit, empty hopper scoop, hopper jam, and overpay conditions.

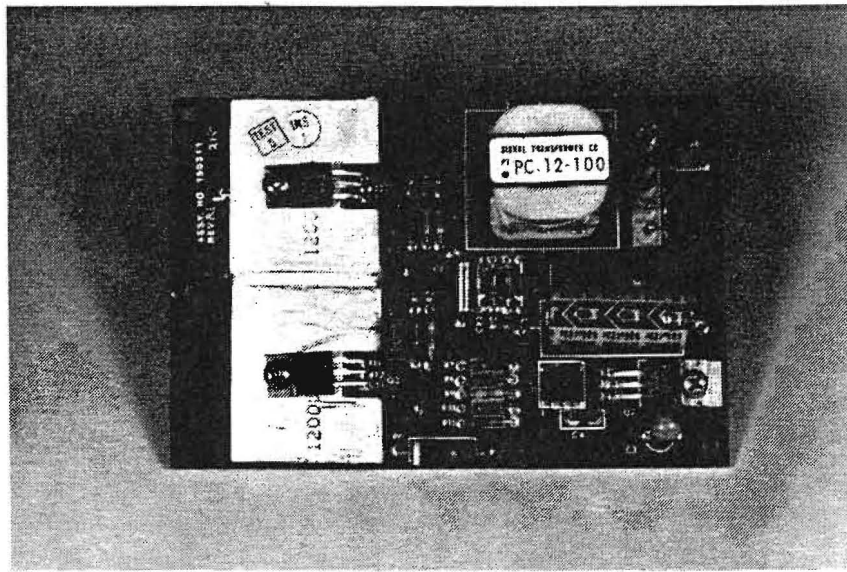


Hopper Controller Board

The Hopper Controller Board is located to the left of the hopper housing, positioned vertically, and mounted either behind the front of the hopper frame or on the left side of the frame assembly.

The purpose of the Hopper Controller board is to control the operation of the Hopper Motor. A secondary circuitry independent of the Slot Controller also protects the hopper from a runaway/overpay condition.

The Hopper Controller board is connected to the Hopper Harness by a plug. This facilitates easy removal of the Hopper Assembly in the case of a malfunction or for maintenance.



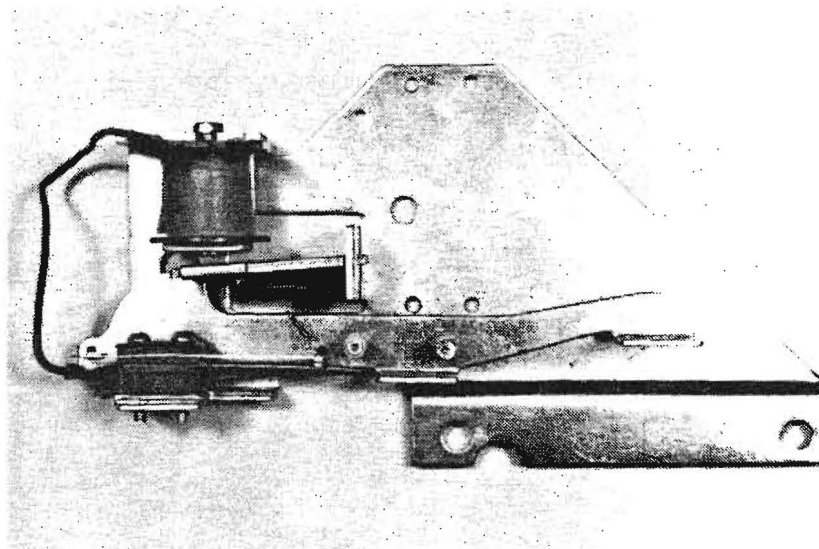
HANDLE MECHANISM ASSEMBLY

The Handle Mechanism Assembly is bolted to the right inside wall of the slot machine cabinet, positioned vertically and to the right of the Reel Mechanism Assembly. Actuation of the Handle Mechanism causes the reels to spin.

Handle Release Coil

The purpose of the Handle Release Coil is to allow operating the handle to kick-off the reels for a spin.

The Handle Release Coil is energized in direct relationship with proper coin-in entry. Once a coin-in is sensed and accepted, the Handle Release Coil is energized. On games which accept more than a single coin, coins may be inserted until the time the handle is fully cycled and the reel-spin sense is initiated.

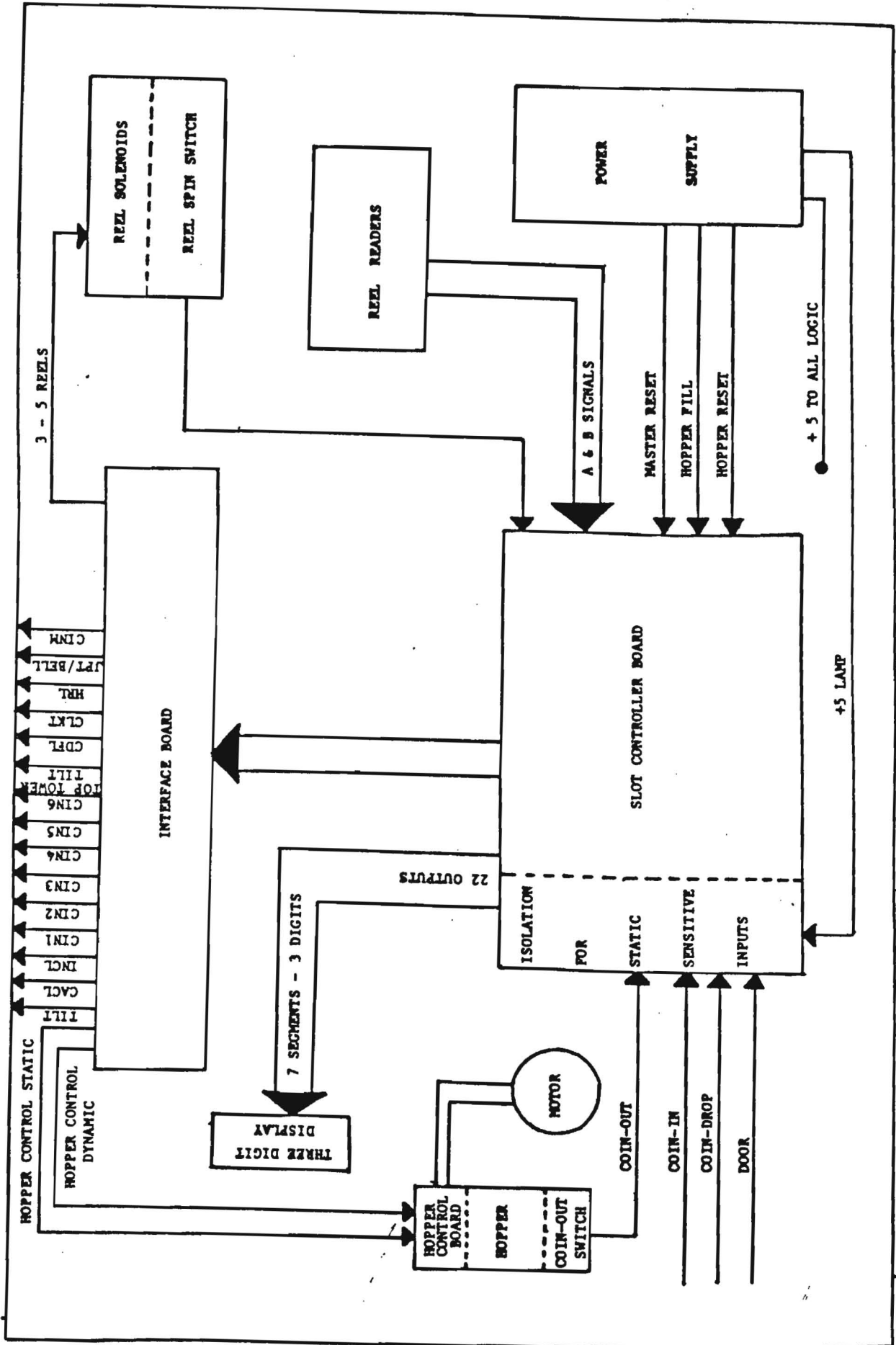


SECTION

II

Operating Principals

FUNCTIONAL BLOCK DIAGRAM OF THE CONTROL ELECTRONICS



LEGEND:

- CACL - Coin Accepted Light
- INCL - Insert Coin Light
- CIN - Coin In
- CDFL - Coin Diverter
- CINM - Coin In Meter
- HRL - Handle Release
- CLKT - Coin Lockout
- JPT/BELL - Jackpot Bell

FUNCTIONAL BLOCK DIAGRAM OF SLOT CONTROL

The block diagram illustrates the machine's workings and shows the relationship between various assemblies or components.

Observe that every assembly is dependent on (either enabled or disabled by) the Slot Controller.

Arrows to and from the Slot Controller Board demonstrate logical information being exchanged.

Arrows toward the Slot Controller Board represent bringing in the information, while the arrows pointed away from the Slot Controller Board represent functions to be executed based on logical decisions made by the control microprocessor.

Power Supply

The Power Supply provides the basic source of power for the electronic components.

This is a single 5 VDC Power Supply with electronic isolation. The purpose of the isolation is to prevent outside electrical interference (accidental or intentional) from entering logic circuits.

•

Standby (Idle State)

In order for a slot machine to operate, a legal denomination coin has to pass the "main gate" Coin Lockout which is controlled by the CPU (Slot Controller) through an opto-isolation circuit.

Coin acceptance is not controlled by the Slot Controller, but Coin Lockout is controlled. Therefore, operation of the Coin Lockout plays an important role in the proper functioning of a slot machine.

Insert Coin Light

Machine-ready status is indicated by the Insert Coin Light. It is only information to a player and does not play an active role. Its on/off states are controlled by the CPU through a control circuit located on the Interface Board.

Physical connections (transfer of electrical signals) are effected in the following way: a logical signal originates in the CPU which is transferred through associated supporting circuits in the Slot Controller Board itself, then through the edge connectors of the Slot Controller and Interface board via printed circuits.

The Insert Coin Light is illuminated by the transfer of 6 VAC "hot" from control circuit U20 to the light bulb socket through printed circuit and wire conductors.

Coin Lockout

The 50 VAC "hot" for Coin Lockout is transferred to the Coin Lockout Coil lug, also via printed circuits and wire conductors. Generally, the condition of the Coin Lockout is indicated by the Insert Coin Light.

Game Initiation

The following indications show that a coin has been deposited and accepted by a machine:

Insert Coin Light - The Insert Coin Light will be illuminated unless the maximum number of coins which can be played have been deposited,
Coin Accepted Light - the Coin Accepted Light is illuminated,
Coin-In - coin pay line/column light are illuminated,
Handle Release - the Handle Release latch assembly is released in order to permit operation of the handle, thereby kicking and spinning the reels.

Coin-In Switch

The Coin-In Switch is the sensing device for deposited coins. This circuit is designed to bring in the information about the depositing of coins. The arrow points toward the "opto-isolation for static sensitive inputs" of the Slot Controller Board.

When the microprocessor receives a signal from the Coin-In Switch, the microprocessor checks its validity and decides whether to credit an award line or inform the slot employee about switch or coin path malfunction or possible tampering, in which case the machine is disabled for play.

If the deposited coin is accepted as a valid one, the player can insert additional coins, the number depending on the type of machine.

The acceptance of coins is confirmed by the microprocessor through separate control circuits (Interface Board) illuminating pay lines or award columns 2, 3, 4, 5, or 6.

The game can be arranged to sound the award bell briefly on each coin-in.

Maximum Coins

When the maximum number of coins per game has been inserted (between handle pulls), the Insert Coin Light is conditioned to turn off. The Coin Accepted Lamp is turned on when the first coin is accepted and remains on while the reels spin until the last reel stops.

Coin Lockout Coil

The Coin Lockout Coil is controlled when the maximum number of coins are played so that any additional coins inserted will be returned to a player in the coin tray.

Game Feature

A machine can also be arranged to have a chime or bell ring and the Tower Light blink a specified number of times (e.g., twice), when the maximum number of coins has been inserted. This reinforces the indication that the player should not insert more coins.

Coin Diverter

Accepted deposited coins are gated to the hopper scoop or to the drop box by a Coin Diverter, which is either energized to direct coins to the hopper scoop or de-energized (open) to pass coins to the drop box.

The microprocessor makes the selection of coin path and will open or close the Diverter only at the end of a reel spin or payout. This is done to prevent coin entry jams caused by slow actuation of the Diverter armature.

Coin Drop Switch

The Coin Drop Switch is located on the coin slide to the drop box. Its purpose is to inform the microprocessor about profit coins. This information is used to increment the internal electronic Coin Drop Meter count.

This signal is optically coupled to the Slot Controller Board. This can be seen on the block diagram by arrows pointed towards the "opto-isolation for static sensitive inputs."

The Coin Drop Switch is connected in parallel to the Jackpot Release Key Switch but is separated functionally by the Control Program.

Handle Release Coil

After accepting deposited coins, the machine allows the player to pull the handle, which is controlled by the Slot Controller energizing the Handle Release coil through a control circuit located on the Interface Board. The Handle Release coil is mechanically connected to the Handle Release latch armature.

Reel Spin Switch

As the slot machine handle is pulled, the Reel Spin Switch will confirm to the microprocessor that the reels have been kicked-off for a spin. This notifies the program to read the reels as they spin. The program synchronizes with the code read from each reel and is able to sense the exact position of each reel at all times.

Reel Indexing

The microprocessor looks at each Reel Reader, starting from left to right, to find the position of stop number one of the reel. It can then correctly index

the reels according to the randomly selected stop positions of the electronic random reel-stop generator (1 through 20-, 22-, 25-stop positions).

Individual reels are stopped sequentially. The reel to the left must index correctly before the Slot Controller causes the next reel to index.

Reel Readers

The reels have to spin properly with tolerable speed for the Reel Readers to inform the CPU that the reels spin correctly.

This information is passed to the CPU by binary coded signals from the spinning reel-stop disks.

Reel Tilts

Any discrepancy of reel spin is also determined by the binary disk code pattern and progress. When a reel spin error occurs, the CPU will halt the progress of a game by displaying a malfunction (Tilt) code on the Win Meter, calling for the slot employee's assistance. Tilt codes are discussed in another section of this manual.

Reel Stop Solenoids

Reel indexing is controlled by the Slot Controller Board and effected by the Reel Stop Solenoid through control circuits on the Interface Board.

Reel Solenoids are connected with mechanical linkages to the latch pawl assemblies.

Reel Indexing Tolerance

With reels correctly spun and indexed, the CPU will look at every indexed position and compare it to the stop positions in the electronic random reel-stop generator. If they agree, the CPU will check its tables for possible payout and either pay an award or wait for coin-in for the next game.

If the reels do not stop where the CPU directed, an error code is displayed in the Win Meter; the Coin Accepted and Tilt Light flash to call attention to the player; the handle will be released automatically. This permits the handle to be operated to spin the reels again. During a replay, the game stops the reels at the positions selected for the original spin (i.e., repeats the display of the original game outcome, not a new game).

Payout

When a winning combination is confirmed to require a payout, the Slot Controller will cause the hopper to dispense coins from the hopper scoop by sending two signals from the Interface Board. The Hopper Control Board will energize the Hopper Motor only after receiving these two signals.

Hopper Motor

The Hopper Motor will rotate the coin pick-up pin wheel in a counter-clockwise direction, which will pick up coins from the hopper scoop and start dispensing them into the coin tray.

Coin-Out Switch

During the period when the Hopper Motor is running, the CPU gets information from the Coin-Out Switch about each coin being dispensed.

This coin-out information goes through opto-isolation for static sensitive inputs (optically coupled).

The Coin-Out Switch is monitored by the CPU at the completion of an award to insure that the hopper stops dispensing coins. The game can be arranged (optionally) to remove itself from play by display of a tilt code and illuminating the tilt lamp in the event of an overpayment.

Coin-Out Problems

The Coin-Out Switch also informs the CPU about no coin exit or possible coin-out tampering, in which case the CPU instantaneously halts dispensing of coins by displaying malfunction information on the Win Meter drawing attention of the slot employees and surveillance for intervention.

SECTION

III

**Functional Test
and
Trouble-Shooting**

141 = 110 VAC
142 = 50 VAC

C A U T I O N

ON SOME 220V INSTALLATIONS WHERE BOTH AC INPUT LINES (BLACK AND WHITE WIRES) ARE "HOT" RELATIVE TO SAFETY GROUND (GREEN WIRE), THE INTERNAL 115 VAC COMMON WILL REMAIN HOT WITH RESPECT TO ALL METAL CHASSIS PARTS WHEN THE MAIN POWER SWITCH IS OFF. TO REMOVE THIS HAZARD WHILE WORKING ON THE MACHINE, UNPLUG THE POWER CARD.

Mandatory Voltage Checks

- "0" (zero) VAC Line filter "load" side lug. White wire and metal chassis, door frame or Handle Mechanism. Main Switch is either on or off.
- "0" (zero) VAC Power Transformer - lug 1 (white wire) and 7 (black/orange wire). Slot machine Main Switch is off.
- 115 VAC Power Transformer - lug 1 (white wire) and 5 (black wire). Slot machine Main Switch is on.
- 115 VAC Hopper Beau Plug - pins 10 (black wire) and 18 (white wire). Slot machine Main Switch is on.
- 115 VAC Reel Mechanism, J19, 24 pin Beau Plug - pins 17 (white wire) and 18 (black wire). Slot machine Main Switch is on.
- 50 VAC Reel Mechanism, J19, 24 pin Beau Plug - pins 21 (red wire) and 7 (yellow wire). Slot machine Main Switch is on. All slot machine door voltages are supplied through the harness interconnect plug located at the left side rear of the cabinet.
- 220 VAC Power Transformer - lug 1 (white wire) and 7 (black/orange wire). When connected to the 220 VAC main and wired for 220 VAC operation. Main Switch is on. When connecting a slot machine to the 220 VAC main Power Supply, the 220 VAC is

present only on the primary side of the Power Transformer. Lug 1 (white wire) and 7 (black/orange wire). The logic power supply and internal 115 VAC lighting circuits are connected to a 115 VAC source tap on the main power transformer primary (lugs 3 and 7 or 9).

For 115 VAC - jumpers required - pin 1 to 3 and pin 5 to 7.

For 220V - jumpers required - pin 3 to 5.

- 6 VAC Power Transformer - secondary windings lugs 6 (yellow wire) and 10 (blue/black wire).
- 6 VAC Reel Mechanism, J19, 24 pin Beau PLug - pins 7 (yellow wire) and 8 (blue wire).
- 50 VAC Power Transformer - secondary winding lugs 2 (red wire) and 6 (yellow wire).
- D.C. Voltages D.C. Voltages are checked visually on the Power Supply Module by illumination of Logic Power LED when the 120 VAC (logic power) toggle switch is turned on.

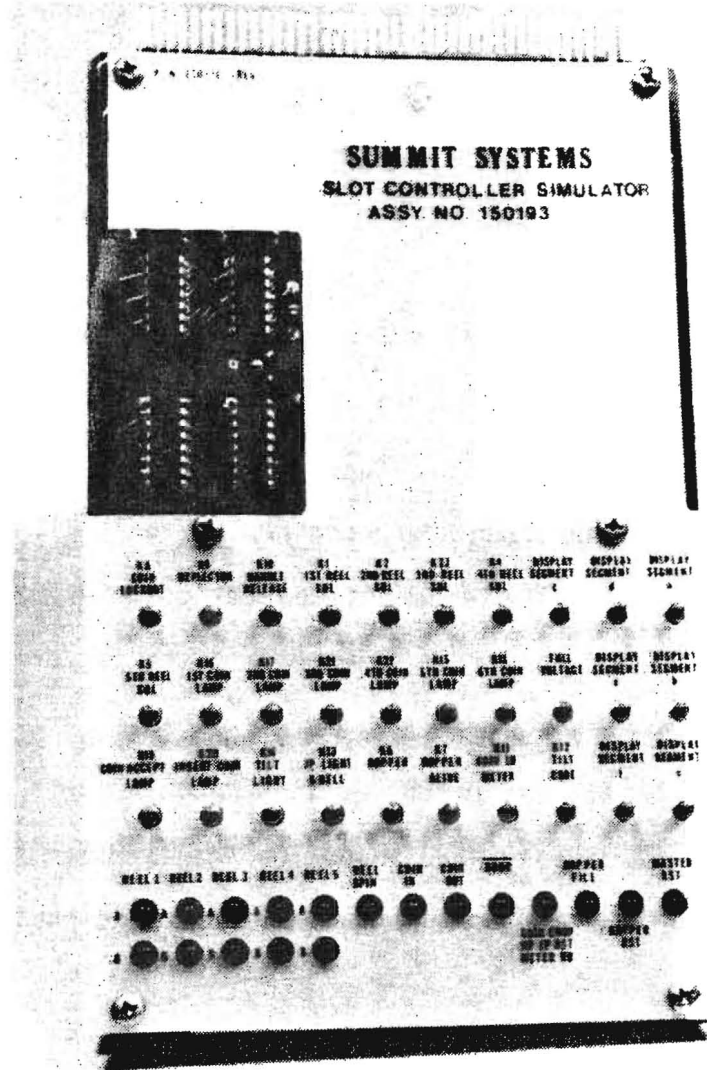
SLOT CONTROLLER SIMULATOR

This part discusses methods of handling game malfunctions and difficulties. Typical problems encountered in operation are illustrated and usual causes are identified.

The purpose of the Slot Controller Simulator is to facilitate checking of the internal circuits normally controlled by the Slot Controller.

By removing the Slot Controller Board and replacing it with the Slot Controller Simulator Board, individual slot machine functions can be checked, cycled as many times as required, and system diagnostic tests performed.

Before the Slot Simulator can function, slot machine power supply voltages have to be present, a Power Supply Module must be inserted and functioning properly, and an Interface Board must be inserted if checking circuits related to interface components.



The Summit Slot Controller Simulator can be used to perform a number of tests. The Slot Simulator also provides the maintenance technician with functional tests for isolation of machine faults and problem conditions. It also provides the capability for performing system operational checks and alignment procedures.

FUNCTIONAL CHECKS

Reel Stop Solenoids K1, K2, K3, K4, and K5

There is a provision on the Slot Controller Simulator Board for up to five Reel Stop Solenoids to be checked for proper functioning.

When K1, K2, K3, K4, or K5 are depressed sequentially, "clicks" are audible as 1, 2, 3, 4, or 5 Reel Stop Solenoids are energized, by application of 115 VAC drive signals to the corresponding coil. This sequence attracts each individual plunger. If reels are spinning, depressing K1 - K5 will index reels.

This confirms proper functioning of K1, K2, K3, K4, or K5 circuits on the Interface Board, wire conductance and good Reel Stop Solenoids.

Hopper Motor - K6, K7

By depressing switches K6 and K7 on the Slot Simulator Board, two mandatory 115 VAC signals are sent from the Hopper Controller Board to two independent circuits which function in a complementary fashion.

When these two circuits are activated, 115 VAC is applied to and energizes the Hopper Motor, turning the pin wheel in a counter clockwise direction.

This confirms the proper function of K6 and K7 control circuits on the Interface Board, wire conductance, Hopper Controller Board, and Hopper Motor.

Hopper motor run state can be maintained by depressing both K6 and K7, then momentarily releasing and re-depressing K7. If both K6 and K7 are depressed

and held, the Hopper Motor should run between 12 - 18 sec. and automatically shut off. In order to sustain hopper motor operation, K7 must be released periodically (i.e., pulsed). If this condition does not exist, suspect a malfunctioning Hopper Control Assembly.

Coin Lockout - K8

By depressing switch K8, 50 VAC is applied to the Coin Lockout Coil, which attracts its armature.

This confirms correct functioning of K8 circuitry on the Interface Board, good wire conductance, Coin Lockout Coil, plug interconnections (Reel Mechanism Beau Plug), Reel Mechanism plug to card cage wiring, and edge connectors between the Interface and Slot Controller points.

Diverter - K9

By depressing switch K9, 50 VAC is applied to the Coin Diverter (deflector) Coil, which attracts its armature.

This confirms correct function of K9 circuit on the Interface board, Reel Mechanism interconnect, wire conductance and Coin Diverter coil.

Handle Release - K10

By depressing switch K10, 50 VAC is applied to the Handle Release Coil, which attracts the Handle Release Latch Arm.

This confirms correct functioning of K10 circuit on the Interface board, Reel Mechanism interconnect, wire conductance and Handle Release Coil.

Electromechanical Coin-In Meter - K11

An electromechanical coin-in meter is optional. For each coin inserted or deposited into machine, this electromechanical meter will increment one count.

By depressing switch K11, the electromechanical meter will be supplied with 50 VAC. This voltage operates the meter one count for every operation of switch K11.

This test confirms proper function of the K11 circuit on the Interface board, Reel Mechanism interconnect, wire conductance, and the electromechanical meter.

Tilt Code - K12

This tilt indicator relates to tilts and possible tampering and is displayed by illuminating a top Tower Light bulb.

By depressing switch K12 on the Slot Controller Simulator Board, 6 VAC is supplied to the Tower Tilt Light bulb (there could be as many as four (4) Tower Light bulbs with different functions) which illuminates as long as the K12 switch is depressed.

This test confirms that the K12 circuit is functioning properly. It also confirms Reel Mechanism interconnect, wire conductance, Tilt Light bulb, and plug interconnections.

"Jackpot" Bell and Tower Light - K13

By depressing switch K13 on a Slot Simulator Board, 6 VAC power is applied to the Bell and top Tower Light bulbs. The Bell rings and the bulb is illuminated simultaneously.

This confirms proper function of the K13 circuit on the Interface board, Reel Mechanism interconnect, wire conductance, Bell, and the light bulb.

Tilt Light - K14

By depressing switch K14 on the Slot Simulator Board, 6 VAC is applied to the Tilt Light bulb (located in the bottom left corner of a Reel Glass), which is illuminated.

This confirms proper function of the K14 circuit on the Interface board, Reel Mechanism interconnect, wire conductance, and the light bulb.

Coins Played Lights

There is a provision on the Slot Simulator Board to check up to six coin pay lines/odds columns.

Coin Lamps - K15, K16, K17, K18, K21, K22

Operation of each these switches causes 6 VAC to be applied to the corresponding lamp circuit on the door or award unit, or both.

Illumination of the lamps confirms proper functioning of the control circuit on the Interface board, Reel Mechanism interconnect, wire conductance, lamp driver circuit located on a separate Line Light Driver board, and the light bulbs.

The coin lamp circuits for the lights should be checked for proper function of the pay line or odds column light circuits by depressing the corresponding switch on the Simulator board:

K15 - 5th coin lamp (5th pay line/5th odds column)

K17 - 2nd coin lamp (2nd pay line/2nd odds column)

K21 - 3rd coin lamp (3rd pay line/3rd odds column)

K22 - 4th coin lamp (4th pay line/4th odds column)

K16 - 1st coin lamp (1st pay line/1st odds column)

K18 - 6th coin lamp (6th odds column)

Coin Accepted Light - K19

By depressing switch K19 on the Slot Simulator Board, 6 VAC is applied to the Coin Accepted Light bulb, which is illuminated.

This confirms proper function of the K19 circuit on the Interface board, Reel Mechanism interconnect, wire conductance, and the light bulb.

Insert Coin Light - K20

By depressing switch K20 on the Slot Simulator Board, 6 VAC is applied to the Insert Coin Light bulb, which is illuminated.

This test confirms proper function of the K20 circuit on the Interface board, Reel Mechanism interconnect, wire conductance, connector and plug pins making contact, and the light bulb.

"A" and "B" LEDs Reel Readers

There are four (4) different logical states displayed by "A" and "B" optically coupled signals: neither A or B, A alone, B alone, and A and B together. These signals represent binary values of 0, 1, 2, and 3, respectively.

At power-on, any one of the above-mentioned states will be displayed through "A" and "B" LED signals on the Slot Controller Simulator Board.

Correct operation of Reel Readers is examined by pulling the handle to spin the reels, slowing down the spin by hand and observing all four (4) states occurring for every reel.

This test confirms correct functioning of Reel Readers, printed circuits ribbon cable conductance, and plug interconnections.

Reel Spin LED

At the start of pulling the handle for a kick-off of reels, the Reel Spin LED on the Controller Simulator is turned off. When the handle is fully operated and reels are spinning, the Spin Switch returns to normal and the LED is illuminated, regardless of handle position.

This test confirms proper functioning of Reel Spin switch, wire conductance, and plug and edge connectors interconnections.

Coin-In Switch LED

When the Coin-In Switch on the slot machine door is depressed, the LED on the Simulator board marked "COIN-IN" is illuminated.

This test confirms proper functioning of Coin-In switch, wire conductance, and Reel Mechanism plug interconnections.

Coin-Out Switch LED

The Coin-Out Switch is actuated by raising the pivot roller arm of the Hopper Assembly. This, in turn, closes the circuit to the LED on the Slot Controller Simulator marked "COIN-OUT" and illuminates it.

This test confirms proper functioning of the Coin-Out Switch, wire conductance, and plug interconnections.

This test should be performed with coins of the proper denomination to insure proper adjustment of the Coin-Out Switch and Switch Operating Lever.

Door Switch LED

The door circuit is activated when the door opens. After insertion of the Slot Controller Simulator and power-up, the LED on the Slot Controller Simulator is automatically illuminated.

This observation confirms proper functioning of the slot machine open Door Switch, wire conductance, and Reel Mechanism interconnections from the switch to the Slot Controller Board. The Door Switch can be cycled and the LED should display the proper indication.

Key Switch LED

Inserting the key into the lock located below the Handle Mechanism and rotating it in the correct direction illuminates the LED on the Slot Controller Simulator marked "COIN DROP HP JP RST METER RD".

This test confirms correct functioning of the key/lock switch actuation, the switch itself, wire conductance, and Reel Mechanism interconnections.

The two functions performed by the Slot Controller as a result of sensing this signal are:

- A. Resetting of the Slot Controller after handpaid jackpot, which is affected only during a game payout state.
- B. Display of internal meters (1-7), which is affected only during an idle state.
- C. In certain special models operation of the keyswitch is used to reset Tilt conditions which would otherwise require opening of the machine door.

Hopper Fill LED

Depressing the Hopper Fill Switch on the Power Supply Module illuminates the LED on the Slot Controller Simulator Board marked "HOPPER FILL."

This test confirms proper function of the Hopper Fill Switch, printed circuit conductance, and printed circuit board interconnections.

Hopper Reset LED

Depressing the Hopper Reset Switch on the Power Supply Module illuminates the LED on the Slot Controller Simulator marked "HOPPER RST."

This test confirms proper function of the Hopper Reset Switch, printed circuit conductance, and printed circuit board interconnections.

Master Reset LED

Depressing the Master Reset Switch on the Power Supply Module illuminates the LED on the Slot Controller Simulator board marked "MASTER RST."

This test confirms proper function of Master Reset Switch, printed circuit conductance, and printed circuit board interconnections.

Full Voltage

A diode is installed in the Slot Controller Simulator in series with all control circuits, which should be tested under marginal power operating conditions.

In the event a control circuit on the Interface Board fails to operate, the circuit should be retested with full voltage to confirm the condition. To do this, the full voltage switch on the Slot Controller Simulator Board is depressed, together with a switch of circuit under test. This will verify correct function of these circuits, and identify those circuits suspected of marginal operation.

Drop Switch

The "Ramp" or Drop Switch is connected in parallel to the Jackpot Reset Key Switch. When it is actuated, it has the same function as the Key Switch during a game-idle state causing an electronic meter display.

In play, the Ramp Chute Switch operates whenever coins, which are accepted for play, are routed to the drop rather than to the hopper. Operation of this switch causes the LED marked "COIN DROP HP JP METER RD" to be illuminated.

Malfunction Isolation

The correct diagnostic approach is to observe major sub-assemblies and isolate malfunctions one at a time. It is unlikely, although not impossible, that problems will occur at the same time in different areas of the machine.

At the onset, a malfunctioning component is recognized by the microprocessor which either halts the game, displaying tilt code, or causes a no idle state to exist between games.

Before attempting to replace any module, it is advisable to depress the Master Reset Switch on the Power Supply Module to see if the problem will clear itself.

Five Step Quick Check for Problem Isolation

1. Power Supply Module
2. Slot Controller Board
3. Slot Interface Board
4. Printed Circuits and associated wiring for continuity
5. Coils and/or Light Bulb

Correct functioning of the first three (3) can be checked by replacing a suspected module. The fourth and fifth are checked for continuity.

Thus far, circuits involved in the operation of a slot machine in reference to the game status and in-service testing have been discussed.

MECHANICAL MALFUNCTIONS AND ADJUSTMENTS

Trouble-free operation and function of a slot machine depends on properly installed assemblies, component adjustment, and lubrication of mechanically interconnected moving parts, which are specified in the lubrication guide.

The electronics of the machine monitor and report malfunctioning areas. When any mechanical assembly doesn't function precisely, the game should be halted until the necessary adjustment has been made or the defective parts have been replaced.

Visual inspection of mechanical parts in operation is the best way to detect mechanical malfunctions and worn parts. Summit provides a number of specifically designed tools and adjustment gages for use in adjusting items such as reel readers and stop solenoids which are important to machine performance.

Handle Mechanism

Adjustments of the Handle Mechanism Assembly have been completed at the factory.

Broken or misadjusted parts within the Handle Mechanism Assembly affect the game to the extent of disturbed normal play. Proper operation of the Handle Mechanism is controlled by electronics and there is no "free handle" in terms of electromechanical slot machines. In the event that the electronics control system for handle release malfunctions, a tilt condition will appear and require maintenance intervention.

Free Handle Pull

A mechanical malfunction causing a free handle pull might allow the reels to be kicked-off and spun with no game resulting since the reels will never index in such a situation.

A possible cause for a free handle pull is a broken extension spring for full stroke pawl or a worn full stroke pawl. A broken extension spring or lock pawl might cause free handle pull as well, but it would be an intermittent condition.

A constant 50 VAC signal to the Handle Release Coil would also give a free handle pull with the result being no reels indexing.

No Handle Return

No handle return can occur for several reasons:

If the handle is pulled too fast, the latch pawl-anti-fast-pull unit stops it. In this case, the handle is stopped. The Rack Lock Lever can be jammed between full stroke pawl and the latch pawl-anti-fast-pull, which has to be released to "free" the handle.

Another possible cause of no handle return is a snapped pin, which holds together the support link and full stroke pawl when the actuating Link Assembly falls out of the Trip Lever's reach.

Handle Return Before Reels Kick-Off

The handle is supposed to be locked down until the reels get kicked-off.

If the edge of the full stroke pawl is worn out, it will not lock the Rack Lock Lever and the handle might return to the up position without kicking-off the reels for a spin.

The Handle Mechanism Assembly should be removed, inspected, cleaned, and worn

out parts replaced and lubricated every 90 days or 500,000 handle pulls, whichever comes first.

Reel Mechanism

All mechanical workings of the Reel Mechanism are controlled by the electronics. Malfunctions will generally be detected and the game voided by displaying a malfunction tilt code on the Win Meter.

Reels Kick-Off

With the reels out of the mechanism, it can be observed if the Trip Operating Lever is tripping off the Stop Bracket at the proper moment.

Stop Bracket

The Stop Bracket adjustment can be checked by observing the toggle levers as the handle is pulled very slowly. As the toggle levers raise up to the point where they almost touch the Toggle Stop Shaft, The latching pawls will move under the toggles, latching them in place and making a clicking sound as they latch up.

At the point where the latch pawls engage, the trip arm of the Trip Operating Lever should be ready to trip off the Stop Bracket to index the reels.

For adjustment, the Stop Bracket is moved in either direction, as needed, and secured.

No Kick-Off One Reel (Crank)

If there is only one reel not kicking-off, it is possible that the crank (Trip Shaft) did not bring the toggles high enough. The crank should be replaced.

No Kick-Off All Reels (Trip Arm)

If all reels do not kick-off and the handle does not return, it is possible that the trip arm did not make contact with the Stop Bracket.

No Kick-Off All Reels (Cylinder)

A dirty Air Cylinder, clogged air holes and dry trip arm could cause reels to not be kicked-off.

Every 90 days, the trip arm should be lubricated with heavy moli-type lubricant to prevent a no kick-off condition and to protect the Trip Operating Lever and Trip Lever from excessive wear at the contact points. If this is not done, premature replacement of those parts may become necessary.

No Kick-Off All Reels (Roll Pin)

The last thing to check for when there is no kick-off of the reels is the roll pin that holds the Trip Lever attached to the Trip Shaft. There is a lot of stress put on this roll pin each time the reels are tripped.

If there is any lost motion "play" between Trip Lever crank and Trip Shaft, misadjustments have already taken place; therefore, before making any adjustment, the roll pin has to be replaced.

No Kick-Off All Reels (Drive Shaft)

Another symptom of a reel kick-off problem is illustrated when reels get kicked-off when the Reel Mechanism is outside the machine cabinet, but no kick-off occurs when inside the machine. If a Drive Shaft is adjusted too long, the toggles will not latch up and the Trip Operating Lever will trip off too soon.

If the Drive Shaft is adjusted too short, the Trip Operating Lever cannot trip off the Stop Bracket. The handle will be "locked" in a "down" position, and the reels will also be locked.

The cylinder linkage (horizontal U-shape) has to be pushed by hand to clear this condition.

When inserting the Reel Mechanism into the cabinet, the roller of the Half Gear Assembly should be observed for proper engagement into the actuator (fork) of the Handle Mechanism.

When properly adjusted, the roller lightly touches the upper inside edge of the actuator.

The problem/symptom of no kick-off is usually identical to misadjustment of either Stop Bracket or Drive Shaft.

Incorrect Reel Kick-Off/Index

Indexing of reels is controlled by the control electronics. A mechanical malfunction is usually the cause of incorrect reel kick-off or indexing.

Index arms are made of softer material than the index levers. If the index arms are not lubricated with moli-type lubricant every 500,000 handle pulls or every 90 days, whichever comes first, the index arm hole that engages into the index arm's stud will begin to wear. Symptoms of incorrect kick-off and wrong indexing will be observed and, most likely, the index arm and index lever will have to be replaced.

The index arms should move freely with no binding on the index levers. Index arm springs absorb the impact during indexing of reel discs. Improper spring tension or a binding lever pivot may cause misindexing tilts.

When there is insufficient spring tension between the index arms and the index levers, there is a possibility that the index arm will break the index arm stop on the index lever. This results when the index arm spring fails to cushion the impact with Index Disc stopping action.

Spin Switch

The Spin switch has a brake/make action used to notify the electronics when the reels were kicked-off for a spin. Mechanical adjustment of the Spin switch is made such that the roll pin actuator operates the switch actuator arm.

When the U-shape cylinder linkage is slowly pushed, an audible "click" confirms correct adjustment. The Spin switch must be in the engaged condition when the game is idle. If not, the electronics will not recognize the handle pull. When this condition exists, the Handle Release Coil will be energized, giving constant "free" handle pull after insertion of coin(s).

Reel Readers

For correct payouts and tilt-free reel operation, careful adjustment of the Reel Readers is important.

During machine idle, by pressing the Hopper Fill switch and positioning every index wheel to any code 3 cutout, the Win Meter will display 1-3 for reel one, 2-3 for reel two, etc.

To assure correct Reel Reader alignment, attach Special Tool #T1033 to Reel Mechanism, the reel is moved downward $3/16$ " and the 1-3 on the Win Meter should change to 1-0, indicating good reader alignment. If it changes to 1-1 or 1-2 and stays in either state for another $1/16$ ", alignment is tolerable. If not, the readers have to be aligned and adjusted accordingly. Reel Readers are preset and should require only minor adjustments. Refer to the Information Bulletin #004A.

Special Tool #T1033 can be obtained for use during in-service reader alignment and Special Tool #T1040 can be obtained for precision adjustment.

MECHANICAL ADJUSTMENTS - REEL MECHANISM

The Reel Mechanism is usually removed from the slot machine cabinet when adjustments are made.

The tripping of the Trip Operating Lever pawl from the Stop Bracket is observed on Figure 3.

The Stop Bracket adjustment can be checked by observing the action of toggle levers as the reels are being kicked.

The dimensions given in Figures 1, 2, and 3 might be altered when the Reel Mechanism is placed back into the individual slot machine cabinet. This depends on the Handle Mechanism and actuator (fork) which engages into the roller of Half Gear Assembly. Therefore, dimensions given are only reference points for checking an adjusted unit.

Procedures for Adjustment

The Reel Mechanism should be placed on a flat surface. When checking dimensions, the Air Cylinder's Link and Pin Assembly should be against the cylinder's Stop Bracket at the rest position.

Drive Shaft Adjustment

The Drive Shaft adjustment is made to provide proper alignment of the Half Gear roller into the Handle Mechanism actuating arm (fork).

Rest Motion - Figure 1

Start with Link and Pin Assembly (B), resting against Stop Bracket (C), and machine at rest. Make adjustment of Drive Shaft using 9 9/64" Drive Shaft gage #120286 by placing the hole in end of gage over pin (X) where Drive Shaft couples to Half Gear. The other end of gage should reach exact center of pin (Z). Adjust nut (E) to accomplish this.

Start Motion - Figure 2

Hook finger in Link and Pin Assembly and pull toward front of Reel Mechanism. Place thumb on Half Gear at pin (X) and push toward rear of Reel Mechanism. Using gage #120285 9 5/64", place end of gage with hole over pin (X), adjust nut (H) until other end of gage reaches exact center of pin (Z).

Half Gear - Figure 3

Check Half Gear Assembly for alignment with gage #120259 by placing Reel Mechanism on hard flat surface and sliding hole in gage over roll pin (Y). The bottom of gage should sit flat on surface with Reel Mechanism at rest.

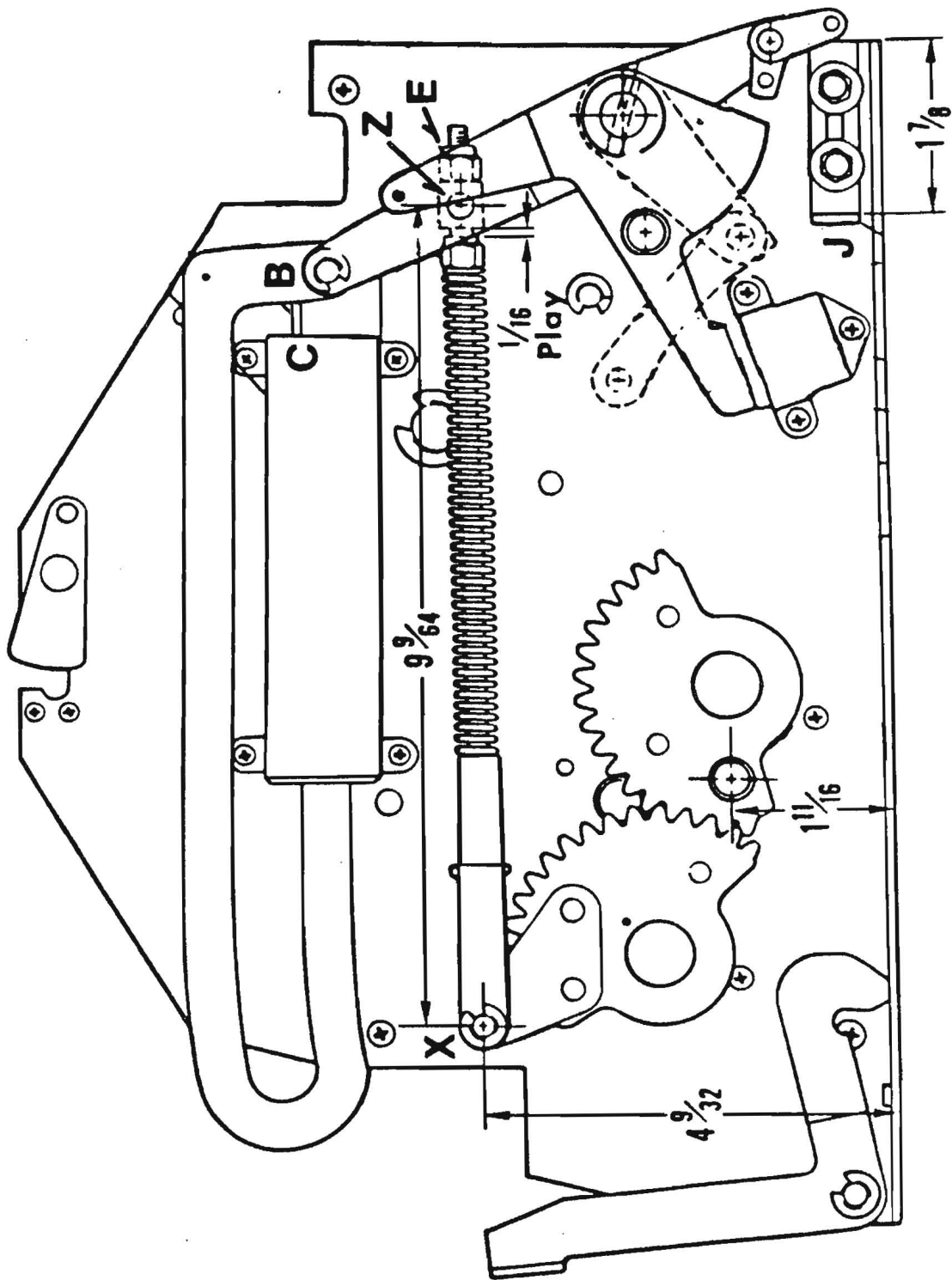


Figure 1.

Stop Bracket Adjustment - Figure 1

Stop Bracket (J) is adjusted so that back edge is flush with back of side plate after Reel Mechanism is placed in cabinet. It is then adjusted to trip as full stroke pawl drops off last tooth of Rack Lever in Handle Mechanism or just before, but assure that all latch pawls engage prior to kick without raising Toggle Stop Shaft (M). Shown in Figure 3.

If proper latch pawl action cannot be acquired on Stop Bracket adjustment, then make them on the Drive Shaft with nuts (H) (E).

Start Motion Position Adjustment - Figure 2

As soon as Trip Operating Lever starts to thrust the Trip Lever, the internal Reel Mechanism's cycle begins its motion for cocking the reels.

Trip Position Adjustment - Figure 3

At this point of trip position, the Trip Operating Lever pawl trips off the Stop Bracket, firing Reel Mechanism driver levers (kickers) to spin the reels.

Sequence of Mechanical Motion

- The handle is pulled.
- The trip operating pawl contacts the Trip Lever, thrusting it upward.
- All cranks (Trip Shaft) are raised.
- Crank assemblies lift the toggle levers upward.
- Toggle levers pass the notch of latch pawls.

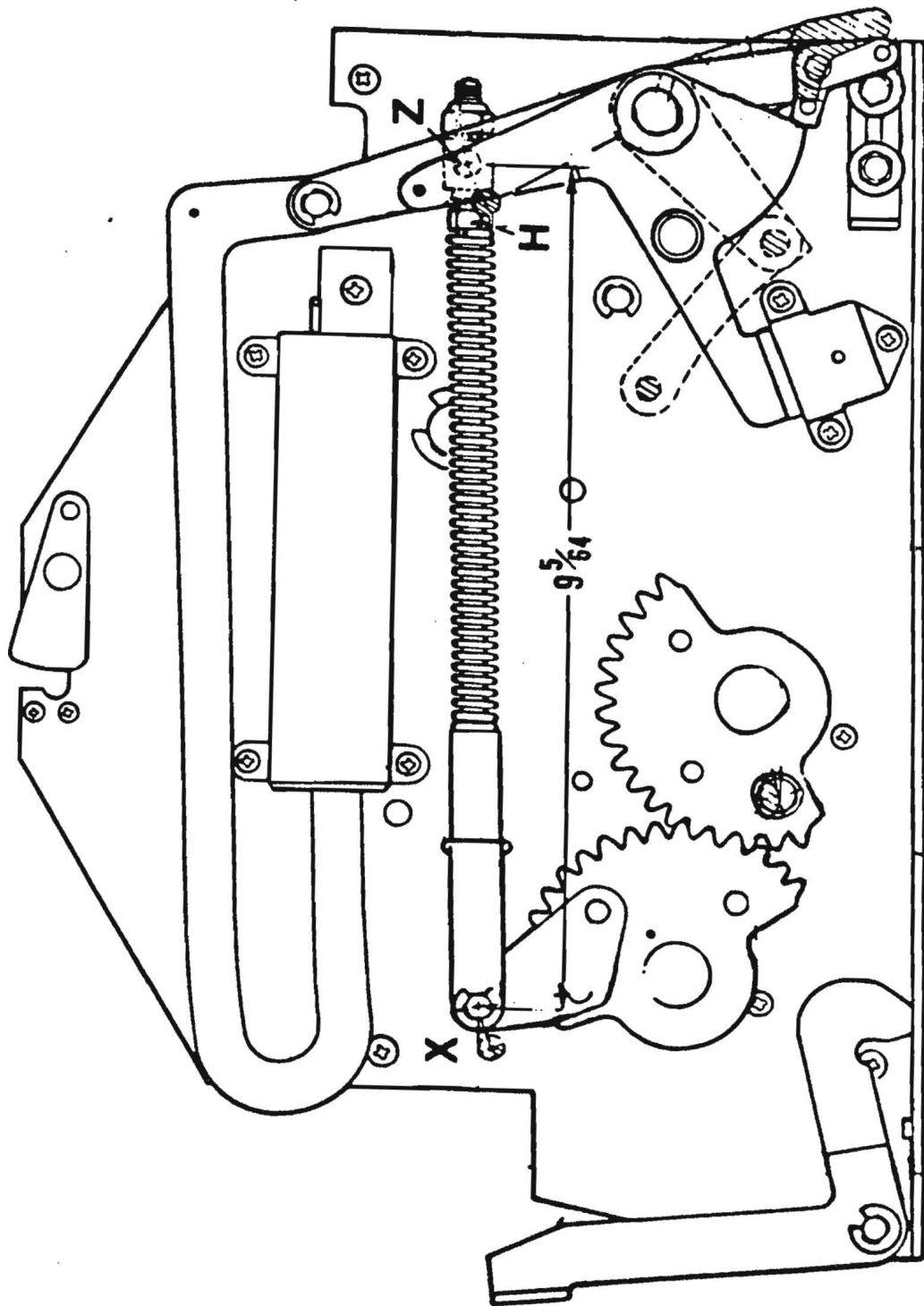


Figure 2.

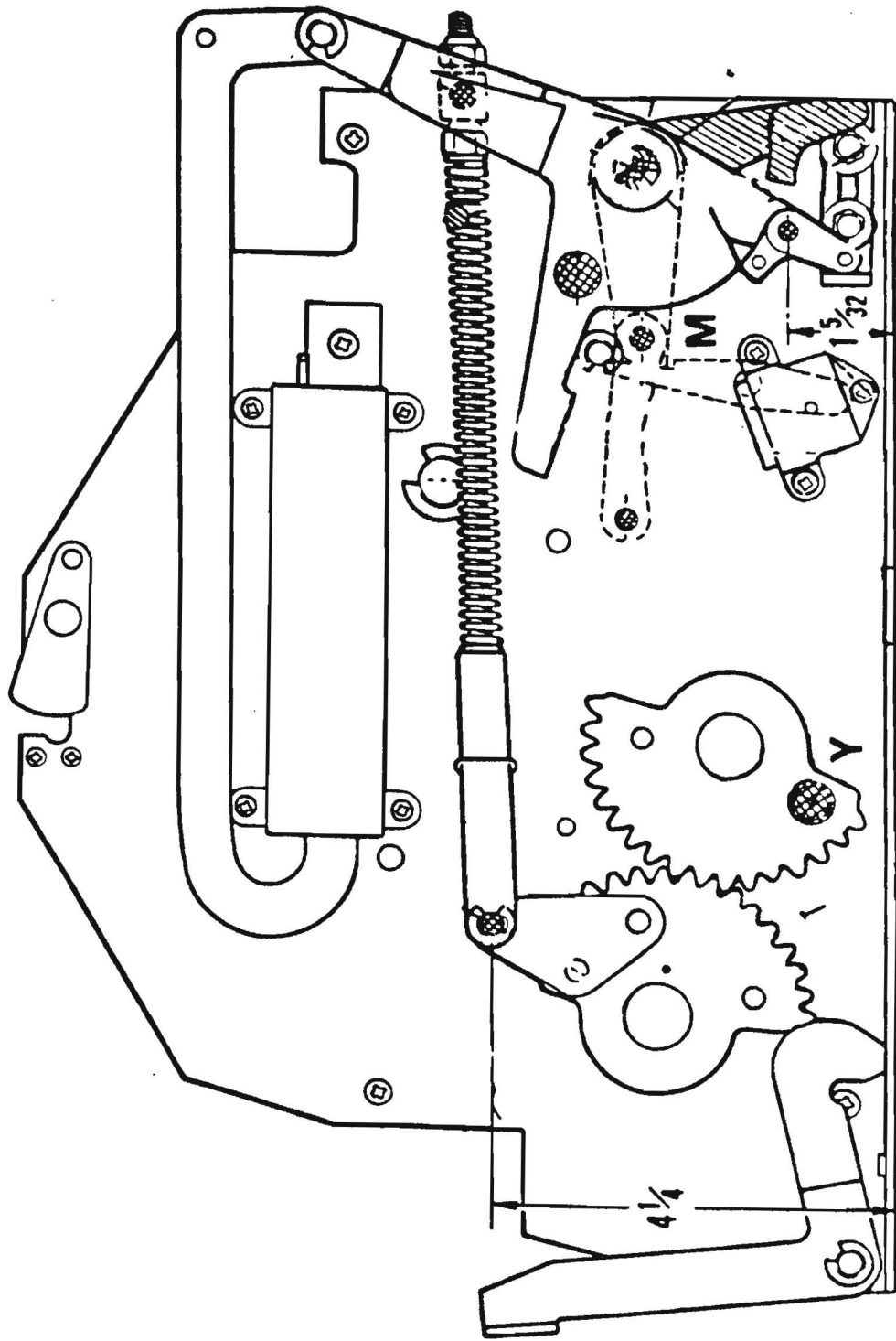


Figure 3.

- The extension springs pull the latch pawls under the toggle levers.
- There is an additional over-travel of all moving parts to insure positive latch.
- Toggle levers reach the maximum upward point touching the Toggle Stop Rod.
- At this point, the Trip Operating Lever pawl trips off the Stop Bracket - as tripping has occurred - reel spin results.

Timing of Reel Mechanism to Handle Mechanism

The Handle Mechanism is designed to relate directly to the Reel Mechanism and the proper relationship of timing between these two assemblies is essential.

The full stroke pawl insures against reversal of handle movement until trip of reels, as the handle is locked in the pulled position, until the Reel Mechanism has been tripped.

The full stroke pawl is checked by slowly pulling the handle and observing that it does not reverse until the Reel Mechanism has tripped.

Air Cylinder

The function of the Air Cylinder is to insure a slight delay during a fast handle pull to allow toggle links to over-travel and allow latch pawls to engage.

This slight delay provides time for the reaction of the related parts to fully function.

A fast handle pull causes the Air Cylinder to delay the motion of the Drive Shaft. This compresses the spring assembly in the drive arm causing a slight delay. The spring then completes the motion and insures proper function.

Reels

The reels should spin straight with no warp or wobble. The reel hubs are equipped with needle bearings for top performance. The reel brakes are not used. Reel speed must be controlled through the use of the correct springs.

The best method for fastening reel strips is to use approximately 3" of transparent mending tape (such as Scotch brand), fastening the end of the reel strip to the reel. Then, using double-sided heavy-duty tape (such as Ludlow Papers and Packaging Div., Chicago, IL or similar), apply to the beginning of reel strip. Periodically, verify that the tape still retains the reel strips in the correct position and that no movement has occurred.

Reel Strip Installation Procedure - Figure 4

Reel strip symbols must be adjusted to correspond to specific index wheel stop positions.

Code holes on the index wheel are arranged in a pattern which gives information to the CPU about reel positions. The following sequence for installing reel strips must be followed:

1. Align reel code window marked "X" on disc assembly with reader (see Figure 4) and set the index arm in the notch marked "V".
2. Position the strip on the reel assembly. On 20 stop discs, align the next to last (19th) reel strip symbol with the center pay line on the Reel Glass. On 22 stop discs, align the next to last (21st) reel strip symbol with the center pay line on the Reel Glass. On 25 stop discs, align the next to last (24th) reel strip symbol with the center pay line on the Reel Glass.

HOPPER ASSEMBLY

Mechanical operation of Hopper Assembly is controlled by the electronics.

If a malfunction is detected, the game halts and a malfunction code is displayed on the Win Meter.

Mechanical problems should be resolved before resumption of game play.

Coin Roller and Coin-Out Switch

Coin flow is controlled by monitoring the operation of the Coin-out switch while coins are being dispensed. As each coin passes under the coin roller, the pivot arm is raised, which in turn, actuates the Coin-Out Switch.

The Coin-Out Switch must be actuated as the coin passes under the roller. The switch should be operated for a period equivalent to about 1/4 of the coin's circumference. This would be approximately the position of the "10" and "2" on a clock face.

Pin Wheel

The pin wheel rides on two ball bearings, and its slant is controlled by the top ball bearing.

Periodic observation of proper pin wheel operation is recommended. When the hopper is full, the pin wheel is pressed when picking up coins for dispensing, and there is a possibility that the pin wheel can be pushed out of its ball bearing seat. This malfunction can cause overpays.

The rocker pin on top of the hopper casting must be tightened snugly, but not over-tightened, as the overload on the ball bearing would prevent the pin wheel from turning freely and damage to the ball bearing might occur.

Hopper Knife

The adjustment of the Hopper Knife (coin track) is made such that the forward point of the knife is as close as possible to the hopper shelf. The knife's left edge should be as close as possible to the pin wheel with no binding.

A coin should not be able to wedge itself between the knife and pin wheel, as the knife would be damaged and the hopper might be jammed. If damaged or worn, a new knife should be installed.

Coin Kicker

On indirect drive hoppers, the quick-acting Coin Kicker mechanically linked to the plunger of the override solenoid diverts coins from the pin wheel into the hopper scoop at the conclusion of a payout.

Proper adjustment of the Coin Kicker is achieved by tightly holding the solenoid plunger against the back of the solenoid, making sure that this compresses the anti-residual spring.

A coin of proper denomination is placed on the pin wheel shelf under the kicker spring plate. If necessary, the solenoid mounting plate is moved in the appropriate direction so that the coin edge is as close as possible to the Coin Kicker spring plate and arm, without actually touching either one.

The Coin Kicker fence installed above the kicker arm must not touch the arm in operation.

Hopper Scoop

The scoop must be adjusted with an eccentric mount (located on the right side of the wheel housing) to avoid binding with the pin wheel. This adjustment applies to direct drive hoppers.

Coin Wiper

The Coin Wiper must be adjusted for clearance from the pin wheel. The correct clearance is one-and-one-half of coin denomination thickness. This assures that wiping action strips a double coin riding to the Hopper Knife. Incorrect adjustment may permit two or more coins to exit at the hopper at the same time.

Grease or oil should not be applied to any area that coins come in contact with.

Hopper Motor Brake

Direct drive hoppers are equipped with a magnetically activated motor brake. When the hopper motor is electrically energized, the brake releases allowing the motor armature to rotate and drive the coin pin-wheel gear train. When the hopper motor is de-energized, the brake is released by a spring attached to the magnetic armature.

Failure to release due to improper spring tension or misadjustment or improper operation due to parts wear can cause the brake to be ineffective. This will result in coin overpayment.

**SECTION
IV**

Fault Location Diagrams

FAULT LOCATION DIAGRAMS

<u>TILT CODE</u>	<u>PAGE</u>
-0-	82
-1-	83
-2-	84
X3-	85
X4-	86
X5-	87
X6-	88
X7-	89
-8-	90
-9-	91
- -	92
---	93
X [~] Y	94
X _~ Y	96

WIN METER DISPLAY

TILT CODE -0-

ELECTRONIC METERS ERASED

SYMPTOM

TILT -0- displayed at power-on. ----->0

Battery voltage less than 2.0V after 14-hour charge/
discharge test. ----->0

Electronic meters not incrementing with closed door
play. ----->0

POSSIBLE CAUSE

J-1 on Slot Controller PCB not connected. <-----0

Battery voltage less than 3.7 volts. Perform 14-hour
charge/discharge test. <-----0

Replace Battery or Slot Controller PCB. <-----0

Adjust or replace door switch. <-----0

WIN METER DISPLAY

TILT CODE -1-

COIN-IN SWITCH JAM, SELF CLEARED

SYMPTOM

Switch Arm does not move freely within guide slot. ----->0
Coin-in Switch loose. ----->0
Coin stuck between Acceptor and Switch. ----->0
Coin stuck between Switch and Diverter armature. ----->0
Coin Acceptor mounting assembly loose. ----->0

POSSIBLE CAUSE

Adjust switch position, adjust or replace wire. <-----0
Tighten switch mounting screws - do not over tighten. <-----0
Remove coin and check coin path alignment. <-----0
Check and adjust Diverter armature. <-----0
Check and adjust coin path ramp below Diverter
armature. <-----0
Tighten Coin Acceptor mounting assembly and check
coin path alignment. <-----0

WIN METER DISPLAY

TILT CODE -2-

COIN-IN SWITCH JAMMED IN OPERATED POSITION

SYMPTOM

Coin stuck holding switch operated. ----->0
Switch arm stuck in operated position binding on
guide slot. ----->0
Coin stuck on Diverter armature. ----->0
Code -2- cannot be cleared. ----->0

POSSIBLE CAUSE

Remove coin and check coin path alignment. <-----0
Adjust switch position, adjust or replace wire. <-----0<-----0
Adjust Diverter armature for free coin passage. <-----0
Check operation of switch with slot simulator,
replace faulty switch if indicated. <-----0
Replace Slot Controller PCB assembly. <-----0
Trace coin-in circuit wiring and correct fault. <-----0

WIN METER DISPLAY

TILT CODE X3- (X DENOTES REEL NUMBER)

REEL X SPINNING SLOW OR NO SPIN

SYMPTOM

All reels not spinning, reel 1 reported. ----->0
One reel not spinning. ----->0
Reel(s) binding on Index Arm, Reader or door trim. ----->0
Excessive play between trip lever and shaft. ----->0
Latch Pawl not properly engaged with toggle link. ----->0
Drive link extension spring broken or damaged. ----->0
Index lever binding at selector base. ----->0
Code 13- occurs before Full Stroke Pawl in handle
mechanism reaches first notch in Rack Lock Lever. ----->0
Code X3- cannot be cleared. ----->0

POSSIBLE CAUSE

Broken or missing Extension Spring. <-----0
Trip Stop bracket misadjusted. <-----0
Reel Hub bearing misadjusted. <-----0<0<0
Crank not properly engaging in reel disk. <-----0
Damaged/worn reel pin in Trip Lever, replace. <-----0
Worn/damaged Toggle Levers. <-----0
Replace. <-----0
Worn/damaged Index Lever, repair, replace, clean,
lubricate and adjust. <-----0
Adjust spin switch operation point or replace. <-----0
Replace Slot Controller PCB assembly. <-----0

WIN METER DISPLAY
TILT CODE X4- (X DENOTES REEL NUMBER)
REEL X SPINNING BACKWARD

SYMPTOM

Index arm loose, worn part. ----->0
Index Arm not clearing index disk. ----->0
Side plate worn. ----->0
Drive Lever (kicker) bushing damaged or worn. ----->0
Reels spin before Full Stroke Pawl in Handle
mechanism reaches last notch in Rack Lock Lever. ----->0

POSSIBLE CAUSE

Replace worn parts as required. <-----0
Index arm dirty or binding, repair, replace, clean,
lubricate and adjust. <-----0
Repair or replace side plate. <-----0
Replace worn/damaged parts, adjust and lubricate. <-----0
Misadjusted Trip Stop bracket. <-----0
Misadjusted Drive Shaft. <-----0
Worn piston in air cylinder, replace piston. <-----0
Oversize hole in air cylinder, replace cylinder
assembly. <-----0

WIN METER DISPLAY
 TILT CODE X5- (X DENOTES REEL NUMBER)
 CANNOT READ REEL X

SYMPTOM

- One or both Readers on Reel X failing when tested with slot simulator. ----->0
- Readers responding intermittently when tested with slot simulator. ----->0
- Tilt Code X5- after replacing index disk. ----->0
- Tilt Code X5- after readers test OK and no loose connections. ----->0

POSSIBLE CAUSE

- Replace reader assembly, align and test. <-----0
- Check for loose Reader Bus and Bus Cable connections at Bus and Backplane. <-----0
- Check new disk for correct part number. <-----0
- Check code hole pattern against known good part. <-----0
- Replace Slot Controller PCB assembly. <-----0

WIN METER DISPLAY

TILT CODE X6- (X DENOTES REEL NUMBER)

REEL X FAILED TO INDEX

SYMPTOM

Reel X and another fail to stop when tested with Slot
Controller. ----->0

Only Reel X fails to index when tested with Slot
Controller. ----->0

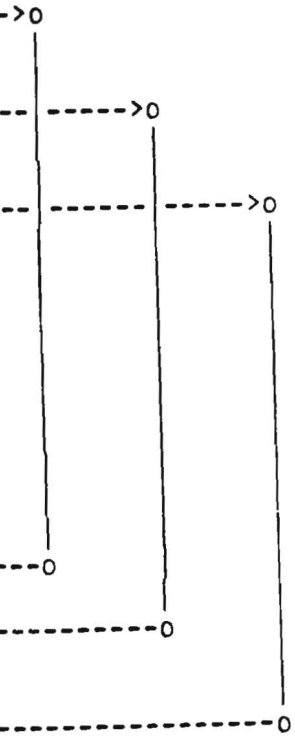
Reel X fails to index when tested with Slot Simulator
and known good Interface PCB assembly installed. ----->0

POSSIBLE CAUSE

Open common circuit in Stop Solenoid assembly between
Reel X and the preceding reel. <-----0

Replace Interface PCB assembly. <-----0

Open circuit in stop solenoid or stop solenoid drive
circuit. <-----0



WIN METER DISPLAY

TILT CODE X7- (X DENOTES REEL NUMBER)

REEL X SPINNING TOO FAST

SYMPTOM

Drive Shaft Compression Spring misadjusted. ----->0

Extension Spring for reel kick wrong part or shortened. ----->0

Air Cylinder vent hole enlarged. ----->0

POSSIBLE CAUSE

Adjust to specifications. <-----0

Replace with appropriate part. <-----0

Replace Air Cylinder assembly. <-----0

WIN METER DISPLAY

TILT CODE -8-

COIN-OUT SWITCH JAM

SYMPTOM

Coin under roller, no exit chute jam. ----->0

Coin under roller, improper coin positioning or double coins. ----->0

Pin wheel positioned below housing or worn. ----->0

Pin wheel binding or wobbling. ----->0

Pivot arm binding or stuck. ----->0

Coin-out switch not switching when tested with Slot Simulator. ----->0

Coin pile-up at exit chute. ----->0

POSSIBLE CAUSE

Coin Deflector bent, replace and adjust (Indirect drive type), or improper brake performance (Direct drive type) - replace worn parts and armature spring. <-0

Replace worn/damaged coin deflector. <-----0

Adjust ball thrust bearing for proper position and rotation. <-----0<-0

Check and replace worn drive roll pin. <-----0

Adjust and lubricate coin pivot arm, replace pivot arm spring. <-----0

Check circuit for open or cross, replace switch and adjust. <-----0

Check and adjust exit chute at hopper and alignment with door. <-----0

WIN METER DISPLAY

TILT CODE -9-

COIN-OUT SWITCH JAM, SELF CLEARING

SYMPTOM

Pivot arm binding or erratic. ----->0
Coin-out switch misadjusted. ----->0
Hopper overloaded. ----->0
Erratic coin flow. ----->0

POSSIBLE CAUSE

Replace worn or damaged parts, lubricate and adjust. <-----0
Replace pivot arm return spring. <-----0
Test and adjust coin-out switch, replace if
unreliable. <-----0
Check and adjust operation of coin diverter. <-----0
Check and adjust exit chute at hopper and alignment
with door. <-----0

WIN METER DISPLAY

TILT CODE --

FREE HANDLE PULL, NO COIN-IN DETECTED

SYMPTOM

Handle Release coil anti-magnetic sleeve missing. ----->0
Handle Release Latch arm failing after fast handle
operation. ----->0
Handle Release Latch arm not engaged. ----->0
Handle Release magnet powered at all times. ----->0
Handle Release operating correctly. ----->0

POSSIBLE CAUSE

Install new coil with anti-magnetic sleeve. <-----0
Lock Pawl spring missing, worn or damaged, replace. <-----0
Handle Release armature not seated properly, replace
worn/damaged parts and adjust. <-----0
Replace Interface PCB with known good assembly. <-----0
Trace circuit and correct faulty wiring. <-----0
Check spin switch adjustment. <-----0

WIN METER DISPLAY

TILT CODE ---

ACCUMULATED OVERPAYS EXCEED SELECTED THRESHOLD

SYMPTOM

Indirect drive hopper, worn or bent deflector knife. ----->0

Indirect drive hopper, binding pivot arm or solenoid
armature. ----->0

Direct drive hopper, worn or broken brake. ----->0

Direct drive hopper, weak brake spring or improper
part. ----->0

POSSIBLE CAUSE

Replace worn or broken parts and adjust for proper
operation. <-----0

Clean and adjust pivot arm and solenoid assembly. <-----0

Replace solenoid assembly. <-----0

Replace brake spring with correct part. <-----0

WIN METER DISPLAY

TILT CODE X⁻Y

REEL X UNDERINDEXED BY Y POSITIONS

Display of this code indicates a reel has stopped sooner (underindexed) than intended:

- ° The first (leftmost) digit indicates the reel number which failed. Code 1 would indicate the leftmost reel, reel code 2 is the one immediately to its right, etc.

- ° The last (rightmost) digit indicates the number of positions by which the reel misindexed. For example, a display 2⁻1 indicates that reel number 2 underindexed by 1 position; code 3₋2 indicates the reel 3 overindexed by 2 positions.

In general, a machine should not misindex in play more than perhaps once or twice in several hundred-thousand games.

Causes of misindexing are (in order of importance):

1. Sticking or binding in the index arm mechanisms.
2. Weak or excessive tension in the index arm springs.
3. Misadjustment of the Reel Stop Solenoids, particularly excessively long or short stroke or wrong solenoid retract springs.
4. Excessive Reel Reader misalignment.
5. Excessive worn component or lack of proper lubrication on the index side of the Reel Mechanism.

Refer to Information Bulletins 1, 3, and 4 for procedures to be used for correct misindexing problems.

The Control Program performs an internal adjustment with its timing during game operation. This is a "learning" process that starts each time the game is powered on. For this reason, the game performance improves with each failure and should rarely misindex in play. Misindexing tilts occurring in succession indicate severe mechanical deterioration.

The Control Program internal timing adjustment is made to extend the period of time until maintenance can be performed. This feature should not be utilized to avoid maintenance.

WIN METER DISPLAY

TILT CODE X_Y

REEL X OVERINDEXED BY Y POSITIONS

Display of this code indicates a reel has stopped later (overindexed) than intended:

- ° The first (leftmost) digit indicates the reel number which failed. Code 1 would indicate the leftmost reel, reel code 2 is the one immediately to its right, etc.

- ° The last (rightmost) digit indicates the number of positions by which the reel misindexed. For example, a display 2_1 indicates that reel number 2 underindexed by 1 position; code 3_2 indicates the reel 3 overindexed by 2 positions.

In general, a machine should not misindex in play more than perhaps once or twice in several hundred-thousand games.

Causes of misindexing are (in order of importance):

1. Sticking or binding in the index arm mechanisms.
2. Weak or excessive tension in the index arm springs.
3. Misadjustment of the Reel Stop Solenoids, particularly excessively long or short stroke or wrong solenoid retract springs.
4. Excessive Reel Reader misalignment.
5. Excessive worn component or lack of proper lubrication on the index side of the Reel Mechanism.

Refer to Information Bulletins 1, 3, and 4 for procedures to be used for correct misindexing problems.

The Control Program performs an internal adjustment with its timing during game operation. This is a "learning" process that starts each time the game is powered on. For this reason, the game performance improves with each failure and should rarely misindex in play. Misindexing tilts occurring in succession indicate severe mechanical deterioration.

The Control Program internal timing adjustment is made to extend the period of time until maintenance can be performed. This feature should not be utilized to avoid maintenance.

SECTION

V

Description Of Operation

DESCRIPTION OF OPERATION

Sequence of Operation

Electrical power must be applied for the machine to operate. When AC power is applied or reapplied following a power interrupt, the microprocessor starts its operation in a unique section of the Control Program which handles power-on and power-recovery. This part of the program determines what the game-state was at the time power was lost, the microprocessor reestablishes the appropriate state and awaits player response. If a reel-spin was in progress at the time of the power-off event, for example, the handle is unlocked and the player is permitted to re-spin the reels by pulling the handle. This action completes the game which was in progress and allows the game to advance to the Idle/Stand-By State.

Idle/Stand-By State

- General Illumination is on.
- Insert/deposit coin light is illuminated.
- Coin Lockout Coil is energized for other than dollar denomination.
- Coin Lockout Coil is de-energized for dollar denomination.

Game Initiating

By depositing 1st coin:

- Coin Accepted Light illuminates.
- Handle Release Coil is energized and handle release latch arm is released.
- 1st coin pay line is illuminated (line machine) or
- 1st coin odds column is illuminated (multiplier machine).
- Coin Lockout is energized unless the machine is arranged for single coin operation, in which case the coin lockout is de-energized.
- Slot machine is ready for handle pull.

By depositing 2nd coin before pulling handle:

- Coin Accepted Light stay illuminated.
- Handle Release Coil stays energized.
- 1st and 2nd coin pay lines are illuminated (line machine).
- 1st coin odds column illumination is turned off.
- 2nd coin odds column illumination is turned on.
- Coin Lockout Coil stays energized.
- Handle Release Coil stays energized.

By depositing 3rd coin or up to maximum number of coins for which the machine is designed before pulling the handle:

- Coin Accepted Light stays illuminated.
- Coin Lockout Coil stays energized.
- Handle Release Coil stays energized.
- 1st, 2nd, 3rd, etc., pay lines are illuminated.
- In line machines, for every inserted coin, a corresponding payline lights up and stays illuminated - the machine pays on every illuminated line.
- In multiplier machines, for every inserted coin, previous coin odds column is turned off and a new odds column lights. The machine pays only the highest payout schedule.

Maximum Coins Game

After inserting the maximum number of coins, before pulling the handle, the following is the status:

- Coin Lockout Coil de-energizes.
- Deposit/insert coin light is turned off.
- Coin Accepted Light stays illuminated.

- Handle Release Coil stays energized.
- All pay lines are illuminated (line machine).
- Last (maximum coins) odds column is illuminated (optionally, Bell rings twice and Tower Light flashes twice).

Handle Pull and Reel Spin

If the coins are inserted with no tilt conditions occurring, the reels will be mechanically kicked-off for a spin. When the slot machine handle is pulled, at the start reel spin, the following is the status:

- Coin Lockout Coil is de-energized.
- Deposit/insert light is turned off.
- Handle Release Coil is de-energized.
- Handle Release latch arm is brought to its normal/resting position.
- Pay lines are illuminated (line machine).
- Odds column is illuminated.
- Spin Switch actuator arm is mechanically reset to its original state, thus, informing the CPU that the reels were kicked-off for a spin.

Reel Indexing

If the reels spin with no tilt conditions occurring, reels will be indexed (stopped) from left to right starting with reel number 1. When the last (right-most) reel indexes:

- Coin Accepted Light is turned off.
- Coin Lockout Coil stays de-energized.
- Deposit/insert coin light stays turned off.
- Pay lines are illuminated, according to the number of coins played (line machine).

- Odds column is illuminated, according to the number of coins played (multiplier machine).
- Game reverts to the Idle/Stand-By State, awaiting the initiation of a new game with the Insert Coin light illuminated.

Winning Combination Automatic Payout

When the last reel is properly indexed and the reels display a winning combination, the game performs the following before releasing the machine into an Idle/Stand-By State, ready to accept coins for a new game:

- Coin Lockout Coil stays de-energized.
- Deposit/insert coin light stays turned off.
- Pay lines are illuminated, according to the number of coins played (line machine).
- Odds column is illuminated, according to the number of coins played (multiplier machine).
- Hopper Motor is energized.
- Coin-Out Switch counts the number of coins being paid out, one increment per coin.
- Total number of machine-paid coins are indicated on the three-digit Win Meter display.

At the completion of automatic payout (idle):

- Coin Lockout Coil re-energizes.
- Deposit/insert coin light is illuminated.
- Coin Diverter Coil energizes and stays energized until the hopper becomes replenished.
- Machine is ready for a new game.

Winning Combination Hand Payout

When the last reel indexes, if the winning combination indicates that the winning amount is higher than machine is set to pay automatically (this amount varies according to the game, the size of the award and the operator's preference):

- Coin Lockout Coil remains de-energized.
- Deposit/insert coin light stays turned off.
- Payout lines are illuminated, according to the number of coins played (line machine).
- Odds column is illuminated, according to the number of coins played (multiplier machine).
- Player/winner gets paid cash in full (see note).

Note: On machines that are arranged to automatically pay partial awards/wins, operation of the Jackpot Award Reset Key Switch may be required to allow machine to resume the payout.

Jackpot Award Reset

When the payout is complete, a machine attendant will insert a key into the Award Reset Key Switch located on the right-hand side of the cabinet. Following operation of this switch:

- Coin Lockout Coil re-energizes.
- Deposit/insert coin light is illuminated.
- Machine is ready for a new game.

Game Security and Exception Codes

This part discusses circumstances and conditions which prevent the Summit game from either completing a game or which indicate some problem or malfunction.

The probable causes of each condition are noted and should be used as a guide to investigate and correct the problem.

Autoslot is designed to function according to legal specifications. Functional check features are incorporated into the design to insure that malfunctions are reported. The most important check feature halts the machine from further play in case of a serious error or malfunction. These conditions result in display of a unique tilt code in the three-digit win meter mounted in the machine door.

Many malfunctions characteristic of electromechanical machines are eliminated in the Summit Machine. The uncontrollable ones, such as incorrect coin paths and physical deterioration of moving parts, are closely monitored. In most cases, the Slot Controller will remove a machine from further play and display an exception code when a problem is detected. Refer to Section IV for an explanation of exception tilt code displays.

SECTION

VI

Coin Check Procedure

COIN CHECK PROCEDURE

The objective of coin checking is to insure that the machine interface between the mechanical components and the electronic controls are operating under casino playing conditions.

The following items should be monitored throughout coin testing procedures:

Deposit Coin Light

The Deposit Coin light is illuminated when the game is in an idle state and extinguishes when the maximum number of coins are played or when handle is pulled and reel spin starts.

Coin Accepted Light

The Coin Accepted light will be illuminated upon acceptance of the first coin played and remain illuminated after maximum number of coins are deposited. The Coin Accepted light extinguishes once handle pull is initiated, and the last reel is stopped correctly.

Coin Path

Coin slides and coin ramps must be unhampered and free flowing.

Coin Acceptor

Must accept all coins played for that particular game and reject incorrect coins.

Coin Lockout

Must be deactivated after the maximum number of coins are played or handle pull is started. All subsequent coins played are returned to player.

Handle Release

Handle release must be activated when the 1st coin played for each game is accepted.

Coin Diverter

When energized, must divert coins into hopper. When de-energized, the diverter must be clear of coin slide so the coins can slide freely through coin drop ramp and switch.

Line Light

On machines of more than single line or of multiplier type, each line or step-up segment must light for each subsequent coin deposited.

Handle Pulls

Pull handle at different speeds and with different amounts of force throughout coin checking to insure proper reel kick, reel spin, and indexing occurs each game.

When a Win Condition Occurs

Count each coin paid out, verify that the number of coins paid matches the amount shown on Win Meter display and award schedule for that particular game. Observe that the hopper maintains proper coin pick-up throughout payout.

Coin Exit

Coin exit from hopper should be unhampered and free flowing. Watch for machine payout when a win condition does not exist on reels, or a no-pay condition

when a winning combination does exist on the reels. Generally, wrong payouts can be attributed to either of two causes:

1. Reel Strip misalignment or the wrong reel strip installed.
2. The wrong EPROM installed in the Slot Controller.

The EPROM part number and reel strips must agree and should be verified.

Win Meter

The Win Meter display changes after the start of reel spin on a machine with the 141XXX EPROM. Win Meter display changes after last reel indexes on machines with the 142XXX EPROM.

IF ANY DEVIATION FROM THE ABOVE OCCURS, THE MACHINE CANNOT ENTER A GAMING ENVIRONMENT.

**SECTION
VII**

Tilt Codes

EXCEPTION/TILT CODES

Code -0-

This code will be displayed on the Win Meter when the internal meters are erased. A possible cause of this type of malfunction could be a faulty or incorrectly connected battery on the Slot Controller card. This code could also be displayed if a malfunctioning Slot Controller circuit exists. Refer to Fault Location Diagram #1 for detailed isolation.

Code -1-

This code will be displayed on the Win Meter when the Coin-In Switch actuator arm is held in down position for a period of time longer than normally required for a coin fall. Display of tilt code 1 indicates the switch actuator has been released.

A possible cause of this type of malfunction is coin-in stringing. When this occurs, a machine is disabled for a game, even if the reels were kicked-off for a spin. The Tilt Light and Tower Light (candle) are illuminated, alerting management and a slot attendant for action.

Operation of the Master Reset (or Hopper Reset depending on game type) clears the tilt code -1-. Award pay line is credited to a player after the tilt condition is cleared and the game is reset. Refer to Fault Location Diagram #2 for detailed isolation.

Code -2-

This code is displayed on the Win Meter when the Coin Switch actuator arm (wire) is held in the down stroke position. Usually, jammed coins in the coin-drop slide building upward cause this type of a jam.

The most frequent code -2- condition reveals no coins around the Coin-In Switch actuator. Usually, the switch actuator is binding and prevented from returning to the up-stroke position.

A misadjusted diverter armature can cause a coin jam. A coin may be stuck on top of the edge of the diverter armature holding the Coin-In Switch actuator in the down-stroke position.

Sometimes, due to vibration, a coin slides off the edge of the diverter armature into the hopper scoop or to the drop box. In this case, exception code -2- automatically becomes code -1-.

Operation of the Master Reset (or Hopper Reset depending on game type) clears tilt code -2-. Award pay line is credited to a player. With tilt codes -1- and -2-, the Insert Coin and Coin Accepted Lights are turned off and the Tilt Light is turned on. Refer to Fault Location Diagram #3 for detailed isolation.

Code X3-

Code X3- is displayed on the Win Meter when one or more reels fail to spin or spins slowly. The value shown in the first (left most) position of the display is the reel number 1, 2, etc., where the problem was detected. A misadjusted Stop Bracket would, in most cases, cause no kick/no spin of a reel. This can also result from an individual crank (Trip Shaft) which didn't move the toggles far enough to be latched by an individual latch pawl. This is a "soft-tilt" condition as indicated by the alternate flashing of the Tilt and Coin Accepted lights. Soft-tilts are cleared automatically by pulling the handle causing the

reels to spin again. If the problem is not cleared by pulling the handle, report the problem to maintenance. Refer to Fault Location Diagram #4 for detailed isolation.

Code X4-

Code X4- is displayed on the Win Meter when one or more reels spin backward. The value shown in the first (left most) position of the display is the reel number 1, 2, etc., where the problem was detected. A misadjusted Reel Mechanism tripping point or a worn out index arm cutout with a quick handle pull could cause this type of malfunction. This is a "soft-tilt" condition as indicated by the alternate flashing of the Tilt and Coin Accepted lights. Soft-tilts are cleared automatically by pulling the handle causing the reels to spin again. If the problem is not cleared by pulling the handle, report the problem to maintenance. Refer to Fault Location Diagram #5 for detailed isolation.

Code X5-

Code X5- is displayed on the Win Meter when one or more reel readers do not produce the expected pattern of binary codes. The value shown in the first (left most) position of the display is the reel number 1, 2, etc., where the problem was detected. Malfunctioning Reel Readers and associated wiring might cause this type of malfunction. This is a "soft-tilt" condition as indicated by the alternate flashing of the Tilt and Coin Accepted lights. Soft-tilts are cleared automatically by pulling the handle causing the reels to spin again. If the problem is not cleared by pulling the handle, report the problem to maintenance. During Reel Reader alignment, all reader control wiring must be checked. Refer to Fault Location Diagram #6 for detailed isolation.

Code X6-

Code X6- is displayed on the Win Meter when one or more reels do not index. The value shown in the first (left most) position of the display is the reel number 1, 2, etc., where the problem was detected. This is a "soft-tilt" condition as indicated by the alternate flashing of the Tilt and Coin Accepted lights. Soft-tilts are cleared automatically by pulling the handle causing the reels to spin again. If the problem is not cleared by pulling the handle, report the problem to maintenance. A misadjusted or faulty Reel Stop Solenoid, broken wire or faulty control circuit on the Interface PCB can cause this type of a malfunction. Refer to Fault Location Diagram #7 for detailed isolation.

Code X7-

Code X7- is displayed on the Win Meter when one or more of the reels spin excessively fast. The value shown in the first (left most) position of the display is the reel number 1, 2, etc., where the problem was detected. In general, this is caused by excess spring tension in the reel kick extension spring. This is a "soft-tilt" condition as indicated by the alternate flashing of the Tilt and Coin Accepted lights. Soft-tilts are cleared automatically by pulling the handle causing the reels to spin again. If the problem is not cleared by pulling the handle, report the problem to maintenance. Refer to Fault Location Diagram #8 for detailed isolation.

Reel Misindexing X⁻N or X₋N

Misindex codes ⁻ and ₋ result when a reel fails to stop at the symbol position selected by the Slot Control Program. These codes are three-digit displays on the LED Win Meter where the middle digit is represented by a - (high dash) symbol at the top of the middle character (e.g., "2⁻1") for underindexing (the

reel stopped sooner than intended) or represented by a _ (low dash) symbol at the bottom of the middle character (e.g., "1_2") for overindexing (the reel stopped later than intended).

- ° The first (leftmost) digit indicates the reel number which failed. Code 1 would indicate the leftmost reel, reel code 2 is the one immediately to its right, etc.

- ° The last (rightmost) digit indicates the number of positions by which the reel misindexed. For example, a display 2-1 indicates that reel number 2 underindexed by 1 position; code 3_2 indicates the reel 3 overindexed by 2 positions.

In general, a machine should not misindex in play more than perhaps once or twice in several hundred-thousand games. This is a "soft-tilt" condition as indicated by the alternate flashing of the Tilt and Coin Accepted lights. Soft-tilts are cleared automatically by pulling the handle causing the reels to spin again. If the problem is not cleared by pulling the handle, report the problem to maintenance.

Causes of misindexing are (in order of importance):

1. Sticking or binding in the index arm mechanisms.
2. Weak or excessive tension in the index arm springs.
3. Misadjustment of the Reel Stop Solenoids, particularly excessively long or short stroke or wrong solenoid retract springs.
4. Excessive Reel Reader misalignment.
5. Excessive worn component or lack of proper lubrication on the index side of the Reel Mechanism.

Refer to Information Bulletins 1, 3, and 4 for procedures to be used for correct misindexing problems.

When misindex codes are occurring, turn the machine power off for several seconds, then turn it on. Play some test games and observe the Win Meter for code $\bar{\quad}$ (high) and $\underline{\quad}$ (low) failures. If any mix-index code ($\bar{\quad}$ or $\underline{\quad}$) events occur for any reel within 10 or 20 test games, perform the corrective adjustments until the game performance improves.

The Control Program performs an internal adjustment with its timing during game operation. This is a "learning" process that starts each time the game is powered on. For this reason, the game performance improves with each failure and should rarely misindex in play. Misindexing tilts occurring in succession indicate severe mechanical deterioration.

Observe that for each code $\bar{\quad}$ or $\underline{\quad}$ occurrence, the handle is released automatically for a replay of the game. Notice that the reels which indexed correctly (i.e., all but the last one which failed) stop on the same symbol during the replay.

Flashing "0" or Digit(s)

This code is displayed on the Win Meter when the Coin-Out Switch actuator is not actuated within a programmed time period. Also, in the case of a hopper jam, hopper empty, or no Coin-Out Switch actuation while the Hopper Motor is being energized, the typical time allowed for hopper time-out is five to ten seconds.

If during this time there is no coin-out detection, a flashing "0" will be displayed. This would be interpreted as an empty hopper scoop or a hopper jam.

In order to recover from the incomplete payout condition, flashing "0" or digit(s), the Hopper Reset Switch is depressed, which stops the digit(s) from flashing. By closing the slot machine door, payout will be resumed, if the tilt condition has been cleared. Refer to hopper fill procedures for detailed data for initial load procedures.

Tilt Code Solutions

Reel tilt codes X3-, X4-, X5-, X6-, and X7- are cleared by maintenance actions or automatic compensation in slot control functions. The Handle Release Solenoid then energizes, allowing another handle pull. If any of the reels were indexed, the same indexed position will repeat.

Prior to maintenance intervention, the recommended method for attempting to clear the tilt code is: pull the handle as soon as the reel tilt code is displayed (Handle Release Solenoid is energized automatically). This is indicated by alternately flashing TILT and Coin Accepted game status Lamps.

The Reel Mechanism should be checked for faulty (worn or broken parts) components and all alignment requirements should be verified before returning the machine to play.

Power Interruption and Game Data Retention

Since AUTOSLOT is an electronically controlled device, electrical power must be applied at all times. In case of power failure, the machine remembers its

status when power is reapplied. The slot machine state at power fail will be resumed automatically at power-up.

A Ni-Cad rechargeable battery serves as a backup to the volatile memory (RAM).

If power fails during machine idle, the same state is automatically restored at power-up. If the power fails at wagering time (e.g., with one or more coins inserted), at power-up, the Insert Coin light will be illuminated, the Coin Accepted light will be illuminated, the Coin Lockout coil will be reenergized; the machine is ready for play automatically. Additional coins can be played when permitted by the game type and provided the maximum number of coins were not played prior to the power interruption.

If the power fails during a spin of reels at power-up, the Handle Release Coil will automatically be re-energized, allowing the handle to be pulled for reels to be kicked-off for a spin. If the power fails during a payout, at power-up, the machine will automatically resume the remainder of the payout.

Electronic Internal Meters

The only way to know the performance and proper functioning of a slot machine is to monitor and record coin data. The coin data is the most important information in determining the machine's profitability.

Autoslot is equipped with seven electronic counters (meters). On request, the information is sequentially displayed on the Win Meter.

All the meters are located in the Slot Controller in a single chip (RAM). This chip is connected to the Ni-Cad battery for coin and game data to be retained in case of power failure.

The following procedure is used to retrieve coin data.

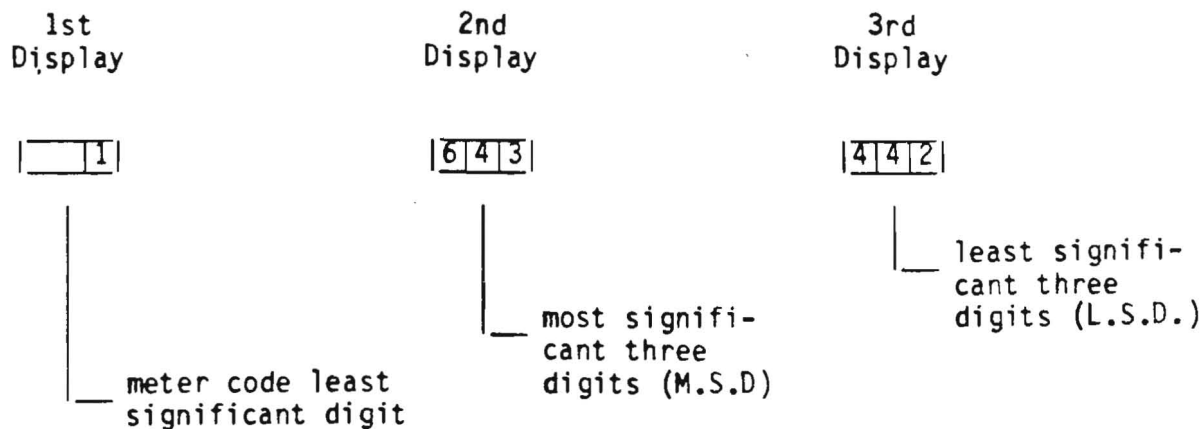
- The Jackpot key is turned while the machine is idle and the Win Meter is read. Each individual meter has three separate displays.

First: Meter identification code (seven codes for seven meters)

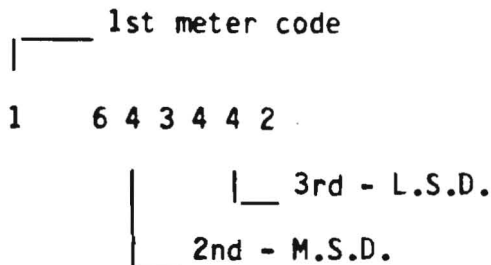
Second: Most significant three digits

Third: Least significant three digits

The meter identification code is displayed by itself in the rightmost (least significant) digit (the other two digits are blank).



Example:



Sequentially displayed as: 1
 643
 442

to be read as: total coins 643,442, etc.

Meter Identification Codes

- 1 total coin-in
- 2 total coin-out
- 3 total coin-drop
- 4 total handle pulls
- 5 total number of coins equivalent as handpaid jackpots (programmed)
- 6 hopper level variance
- 7 current hopper coin count

Meters 1 through 5 and 7 run to 999,999, then start again from 000,000; meter 6 has a 5-digit capacity.

Each meter is updated at the completion of a game when either the last reel is indexed or the last coin is paid out.

Hopper Level Variance

This meter informs the Slot Controller of the number of coins needed for the hopper scoop to be replenished.

Example:

Displayed as: 6 -00 055

Read as: hopper level meter is informing the Slot Controller that there are 55 coins to be directed into the hopper scoop before de-

energizing the Coin Diverter, which will open the gate (its armature), letting coins fall into the coin drop box.

Hopper level code "-" in the first (leftmost) position of the Win Meter means that Coin Diverter is energized. " " (blank) in this position of the Win Meter means that the Coin Diverter is de-energized.

The diverter energizes or de-energizes only at the completion of the game when the last reel indexes or the last coin is paid out. Therefore, if the player inserts 6 coins and the maximum hopper level is reached with the 1st coin, the Slot Controller will not open the diverter after this 1st coin, but at the end of the game. This prevents coin-in jams, a constant occurrence in most slot machines. This sequence would leave 5 extra coins in the hopper scoop until the next payout.

When reading the internal meters, if the Win Meter display contained a number value representing the win payout for the last winning combination, that amount will be displayed automatically at the conclusion of meter display.

If the Win Meter was blanked out at the beginning of meter readings, at the conclusion, the "0" will be displayed in the rightmost significant digit, with the other two digits blank.

**SECTION
VIII**

Lubrication Guide

As with any mechanical components, the proper cleaning and lubrication requirements are essential for a trouble-free and long-lasting operation.

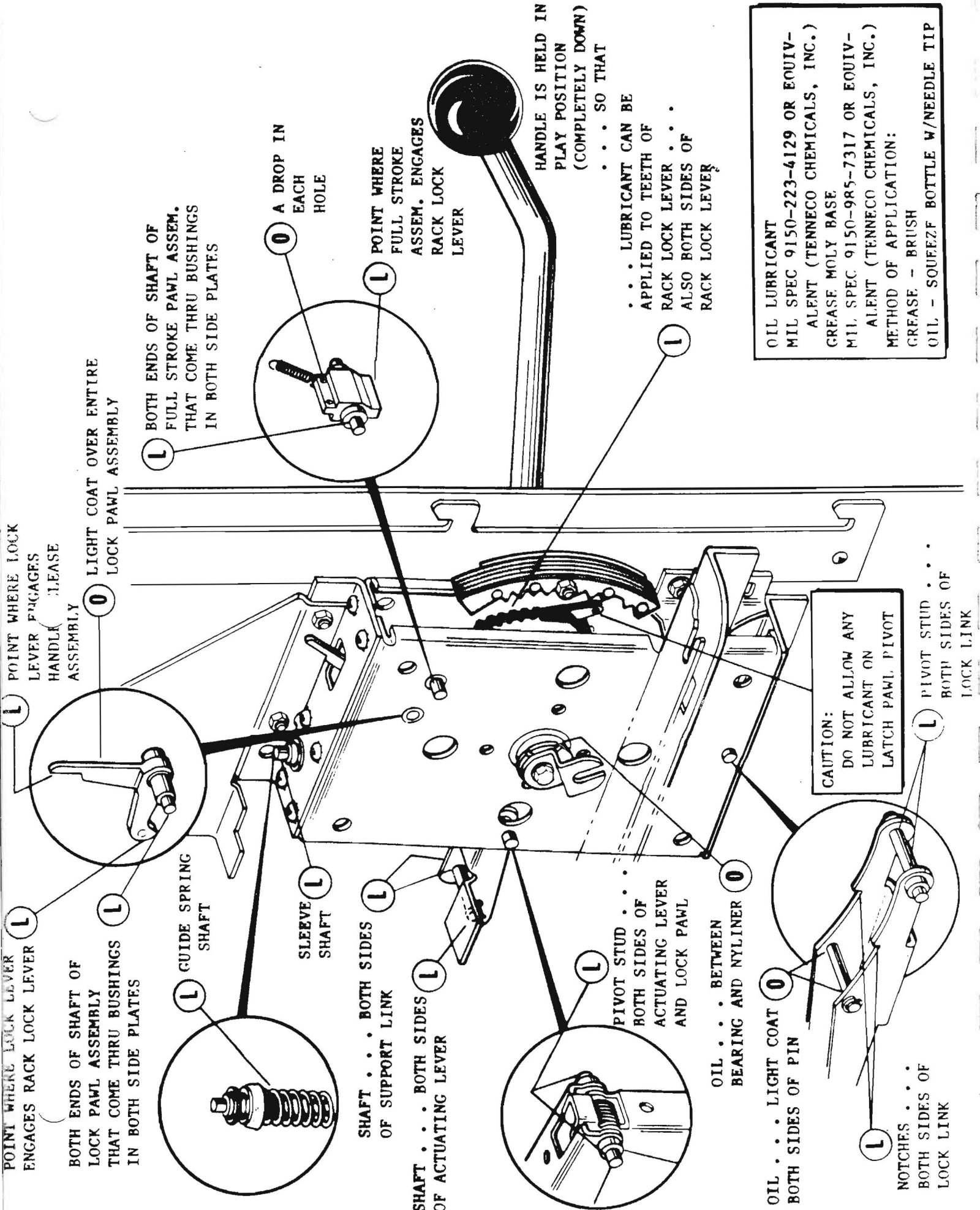
Normally, the criticality of maintaining a slot machine is elevated by supervisory personnel because they know that a more accurate, predictable revenue control system is important and is related directly to the proper maintenance of gaming machinery. Therefore, the following guidelines have been established to ensure that the highest standards of preventative maintenance are used.

Experience shows that more than 90% of the slot mechanism failures and malfunctions are mechanical in nature and stem from improper maintenance and adjustment of mechanical parts. Although the Autoslot electronic slot machine has few mechanical parts, too often the assumption is made that the so-called "electronic" slot machines require less mechanical attention. The electronic package utilized is not a "fix all" and requires a well-maintained mechanical platform to do its job correctly. The mechanical parts are just as important as the electronic parts because they have to work together, each depending upon the other.

The lubrication program should be conducted in the sequence of: 1) cleaning, 2) inspection, and 3) lubrication. Do not just continue to apply more lubrication to a given component, as too much lubrication can produce the same results as no lubrication. Additionally, without the proper inspection of the mechanical items, a worn part that should be replaced might be missed until it eventually fails.

The handle mechanism, reel mechanism, and hopper assembly should be cleaned, inspected for worn parts, and lubricated every 200,000 handle pulls or 90 days, whichever comes first. The lubricant should be applied only to areas of moving parts that come in contact with one another, contact ends of extension and compression springs and on parts under stress (preloaded).

The following pages identify the points of lubrication, the types of lubricant to be applied and the method of application.



POINT WHERE LOCK LEVER ENGAGES RACK LOCK LEVER HANDLE RELEASE ASSEMBLY

LIGHT COAT OVER ENTIRE LOCK PAWL ASSEMBLY

BOTH ENDS OF SHAFT OF FULL STROKE PAWL ASSEM. THAT COME THRU BUSHINGS IN BOTH SIDE PLATES

A DROP IN EACH HOLE

POINT WHERE FULL STROKE ASSEM. ENGAGES RACK LOCK LEVER

HANDLE IS HELD IN PLAY POSITION (COMPLETELY DOWN) . . . SO THAT

LUBRICANT CAN BE APPLIED TO TEETH OF RACK LOCK LEVER . . . ALSO BOTH SIDES OF RACK LOCK LEVER

OIL LUBRICANT
 MIL SPEC 9150-223-4129 OR EQUIV-
 ALENT (TENNECO CHEMICALS, INC.)
 GREASE MOLY BASE
 MIL SPEC 9150-985-7317 OR EQUIV-
 ALENT (TENNECO CHEMICALS, INC.)
METHOD OF APPLICATION:
 GREASE - BRUSH
 OIL - SQUEEZF BOTTLE W/NEEDLE TIP

POINT WHERE LOCK LEVER ENGAGES RACK LOCK LEVER

BOTH ENDS OF SHAFT OF LOCK PAWL ASSEMBLY THAT COME THRU BUSHINGS IN BOTH SIDE PLATES

GUIDE SPRING SHAFT

SLEEVE SHAFT

SHAFT . . . BOTH SIDES OF SUPPORT LINK

SHAFT . . . BOTH SIDES OF ACTUATING LEVER

PIVOT STUD . . . BOTH SIDES OF ACTUATING LEVER AND LOCK PAWL

OIL . . . BETWEEN BEARING AND NYLINER

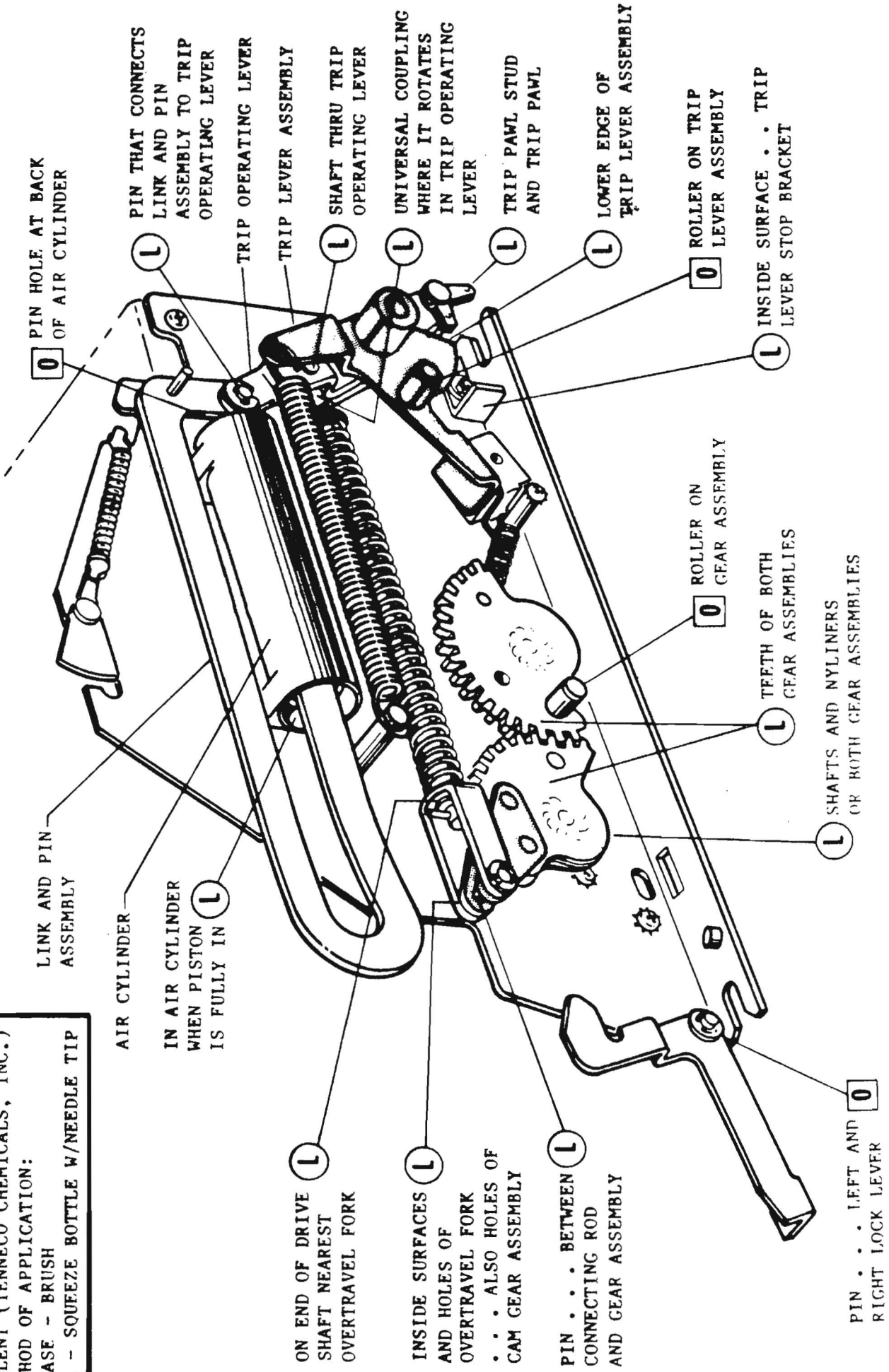
OIL . . . LIGHT COAT BOTH SIDES OF PIN

CAUTION:
 DO NOT ALLOW ANY LUBRICANT ON LATCH PAWL PIVOT

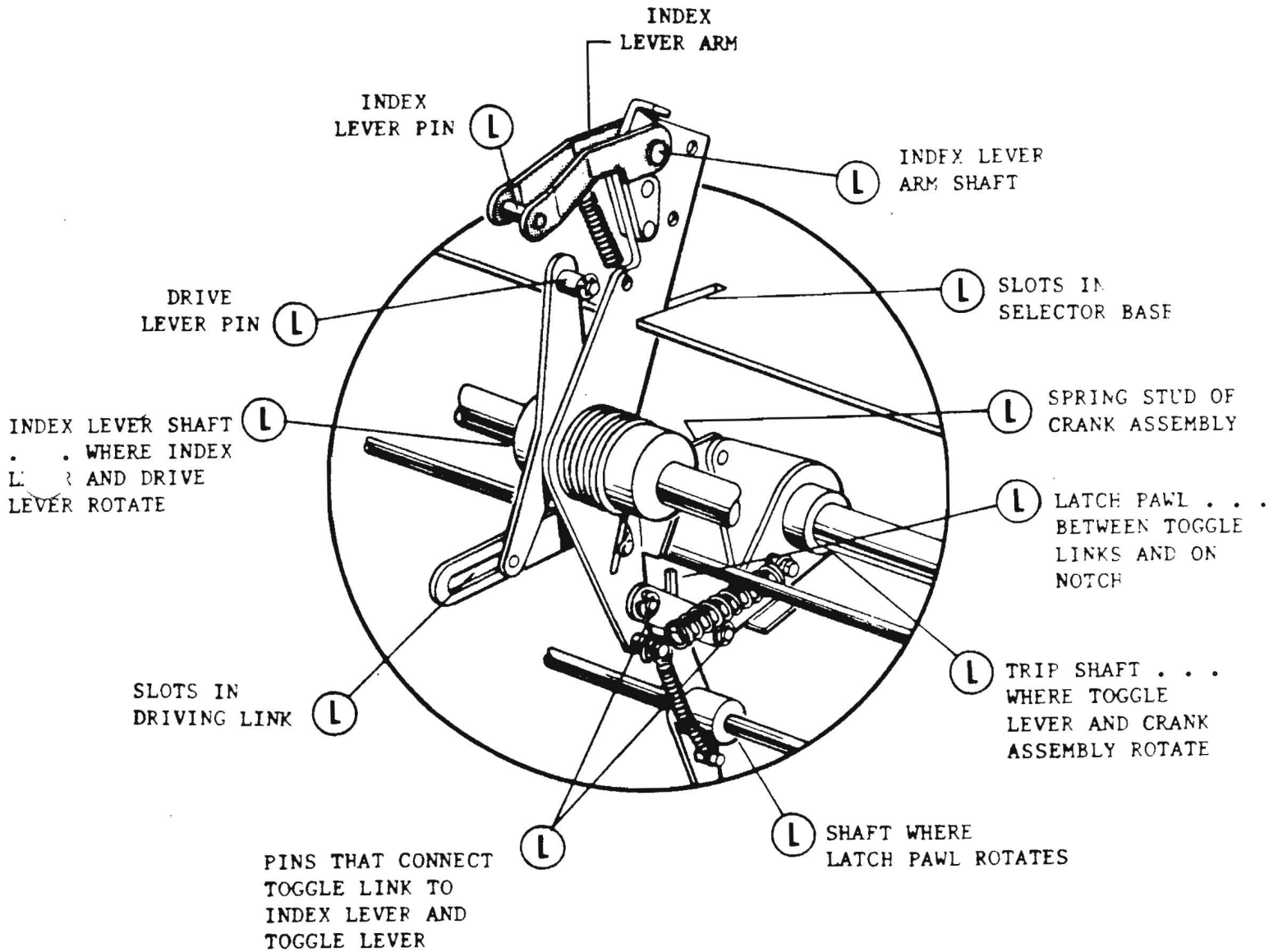
NOTCHES . . . BOTH SIDES OF LOCK LINK

PIVOT STUD . . . BOTH SIDES OF LOCK LINK

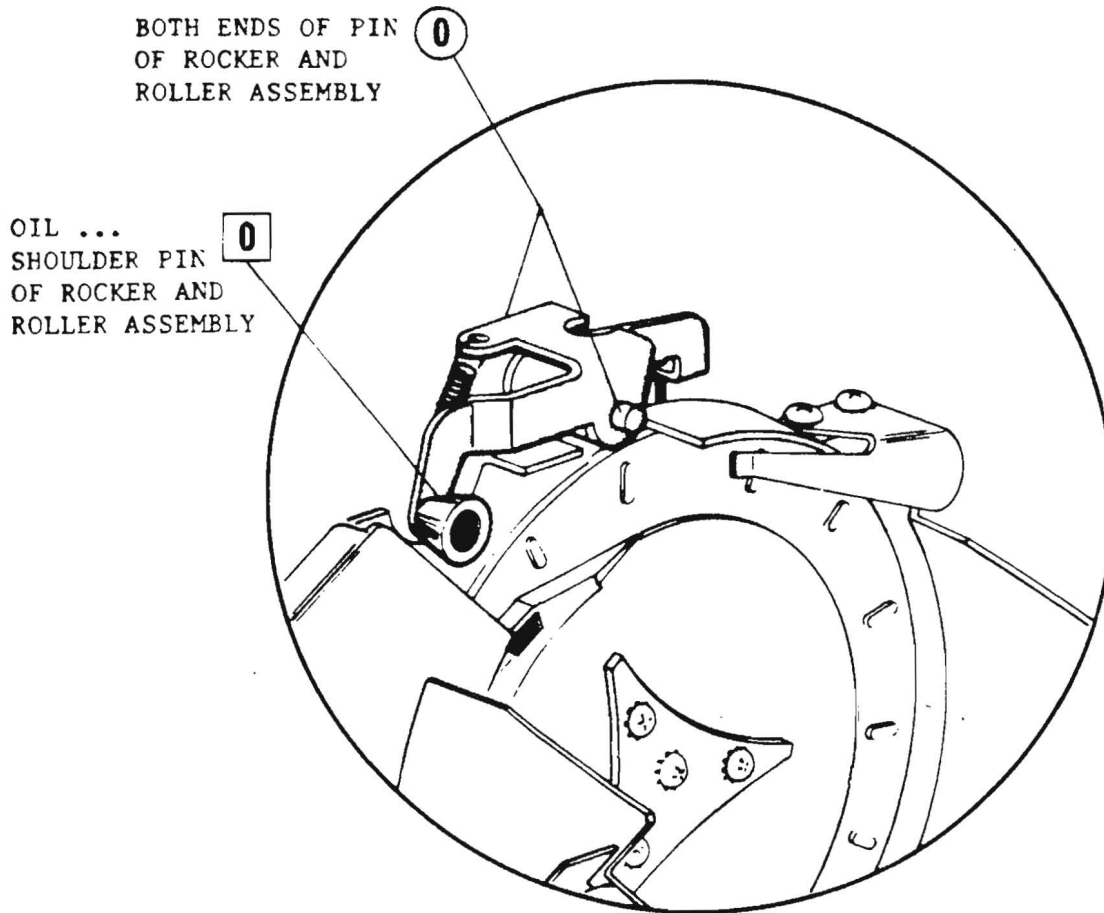
OIL LUBRICANT
MIL SPEC 9150-223-4129 OR EQUIV-
ALENT (TENNECO CHEMICALS, INC.)
GREASE MOLY BASE
MIL SPEC 9150-985-7317 OR EQUIV-
ALENT (TENNECO CHEMICALS, INC.)
METHOD OF APPLICATION:
GREASE - BRUSH
OIL - SQUEEZE BOTTLE W/NEEDLE TIP



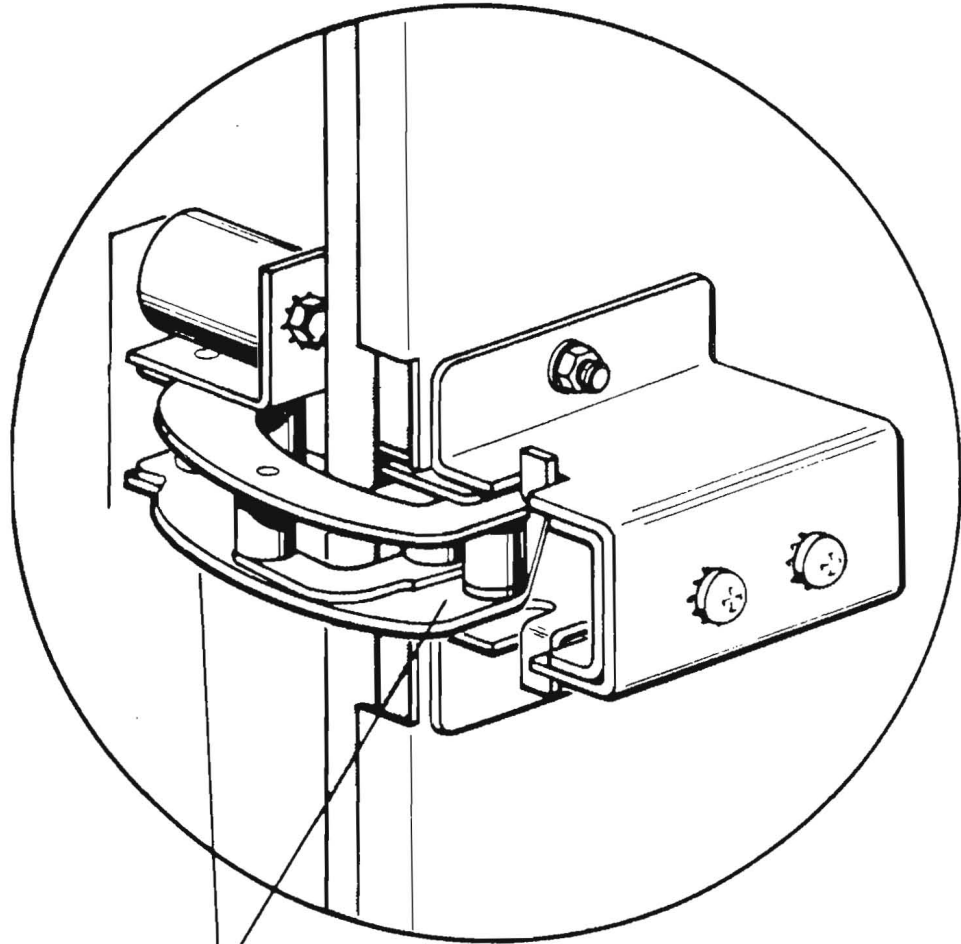
OIL LUBRICANT
MIL SPEC 9150-223-4129 OR EQUIVALENT
(TENNECO CHEMICALS, INC.)
GREASE MOLY BASE
MIL SPEC 9150-985-7317 OR EQUIVALENT
(TENNECO CHEMICALS, INC.)
METHOD OF APPLICATION:
GREASE - BRUSH
OIL - SOUFEZE BOTTLE W/NEEDLE TIP



OIL LUBRICANT
MIL SPEC 9150-223-4129 OR EQUIV-
ALENT (TENNECO CHEMICALS, INC.)
GREASE MOLY BASE
MIL SPEC 9150-985-7317 OR EQUIV-
ALENT (TENNECO CHEMICALS, INC.)
METHOD OF APPLICATION:
GREASE - BRUSH
OIL - SQUEEZE BOTTLE W/NEEDLE TIP



OIL LUBRICANT
MIL SPEC 9150-223-4129 OR EQUIV-
ALENT (TENNECO CHEMICALS, INC.)
GREASE MOLY BASE
MIL SPEC 9150-985-7317 OR EQUIV-
ALENT (TENNECO CHEMICALS, INC.)
METHOD OF APPLICATION:
GREASE - BRUSH
OIL - SQUEEZE BOTTLE W/NEEDLE TIP



L

SURFACES AND ROLLERS
OF MOVING LINKAGES
OF AREA SHOWN

APPENDIX

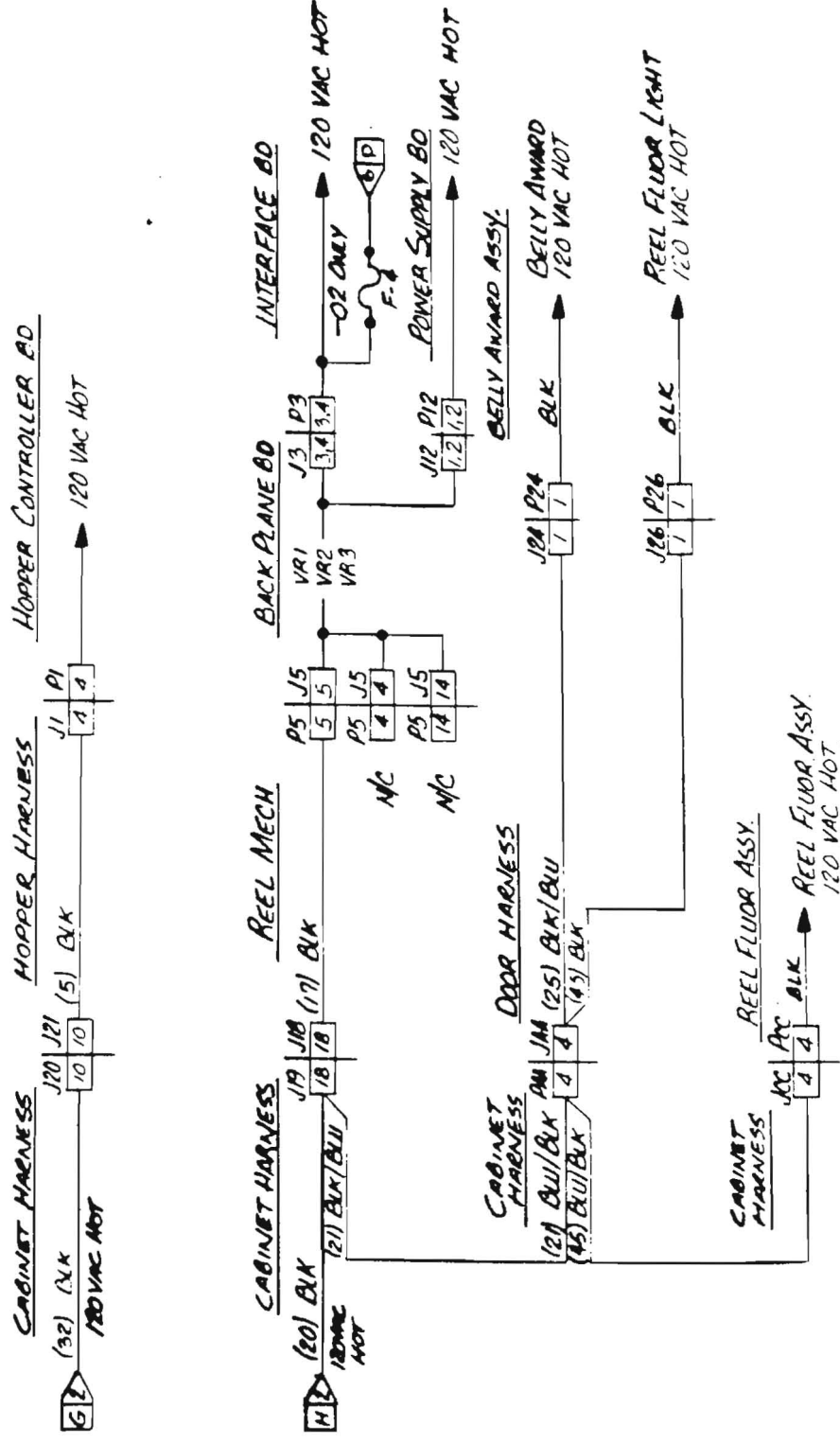
1

Circuit Diagrams

This information is in two related parts. The first part contains Functional Wiring Diagrams which trace each circuit in the slot machine based on the function performed. Each diagram is organized by interest and relationship.

The second part contains tables and diagrams which summarize the signals and control circuits according to connector.

SYMBOL	ECO	REVISIONS	DATE	APPROVED

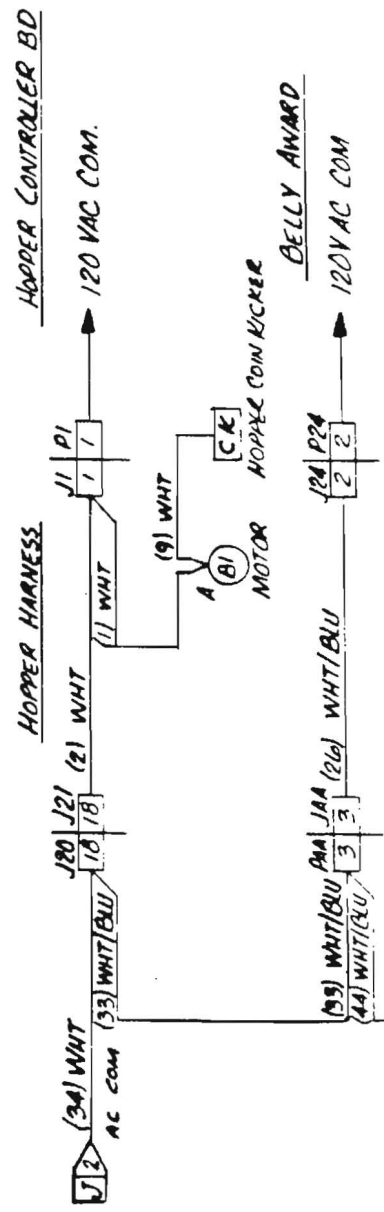
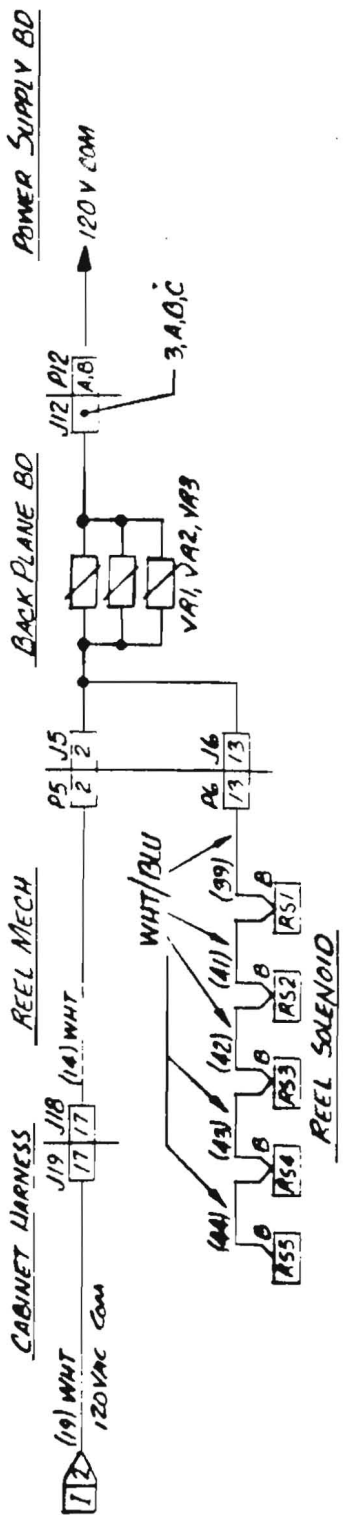


120 VAC HOT DISTRIBUTION

SEE SHEET II FOR COMPLETE WIRING

SHEET NO	150409	REV	8
SCALE		DATE	

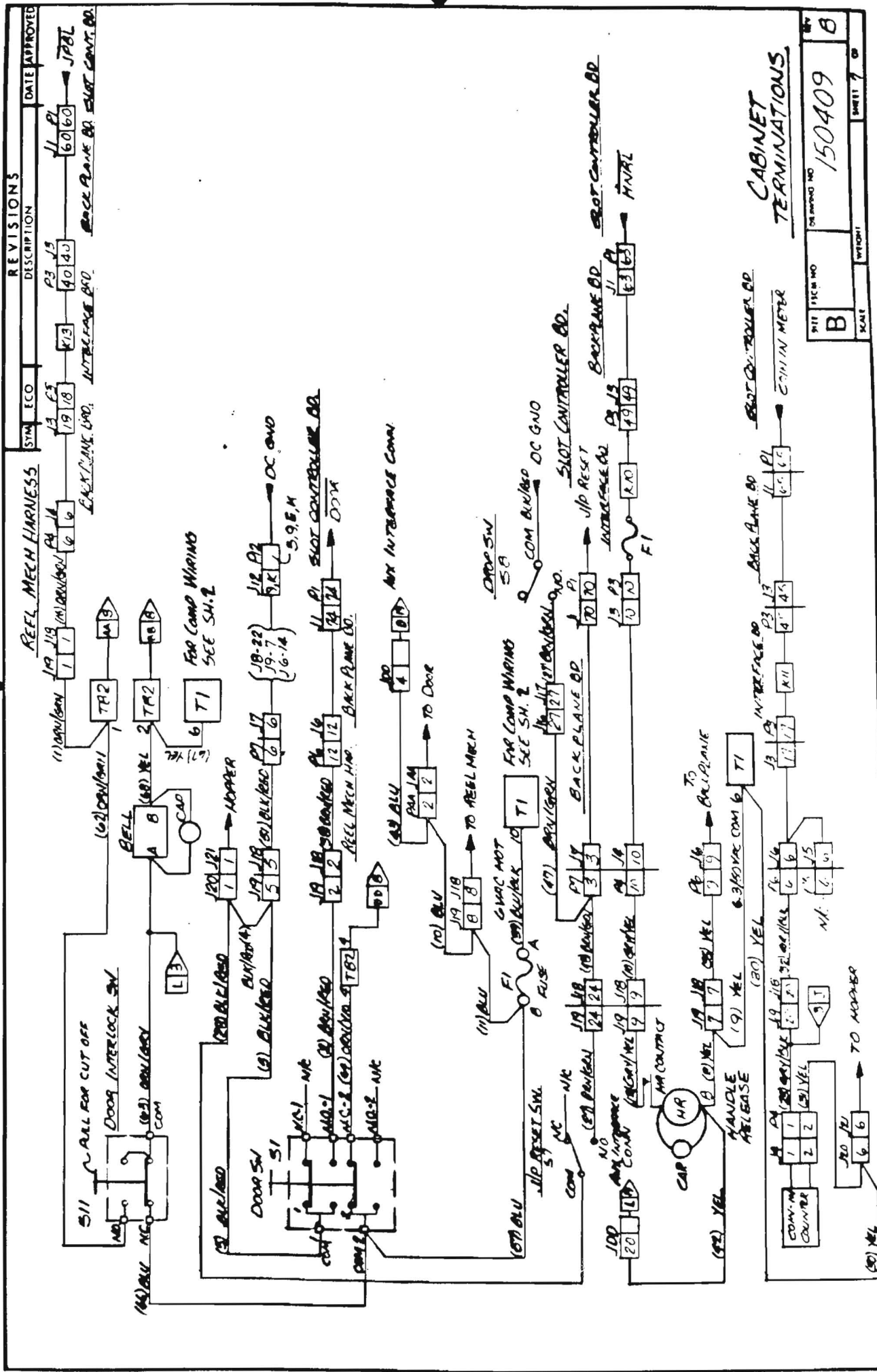
REVISIONS		DATE	APPROVED
SYM	ECO		



120 VAC COMMON DISTRIBUTION

SYM	ECO	DATE	APPROVED

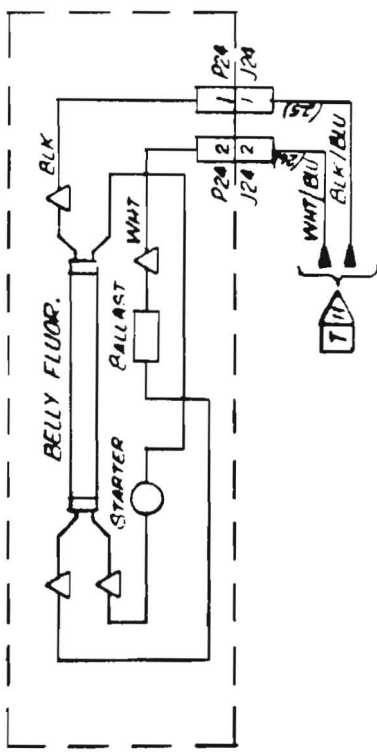
REV	SYM NO	OR PART NO	REV
B		150409	A
SCALE	WEIGHT	SHEET	OF
		3	3



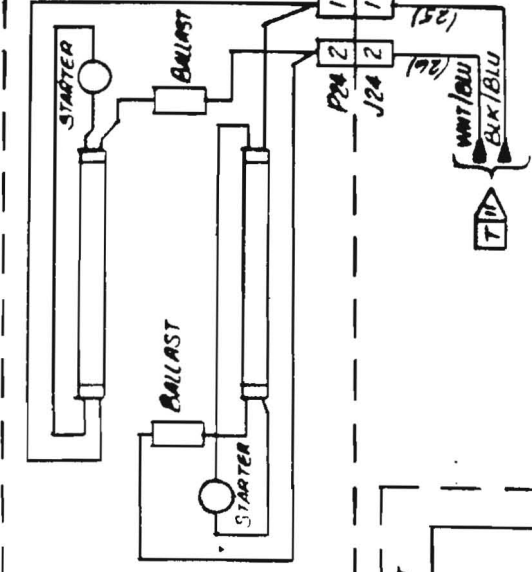
SYM	ECO	REVISIONS	DATE APPROVED
		DESCRIPTION	

△ = CAMP

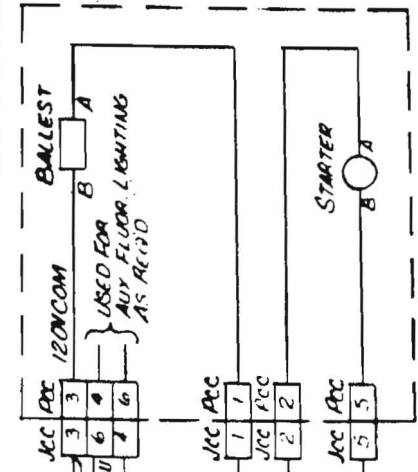
ONE LIGHT



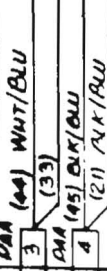
TWO LIGHTS



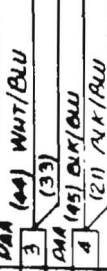
REEL FLOOR ASSY



DOOR HAR.



CAB. HAR.



REEL FLOOR



FL1



FOR COMPLETE WIRING SEE SHEET

HOPPER



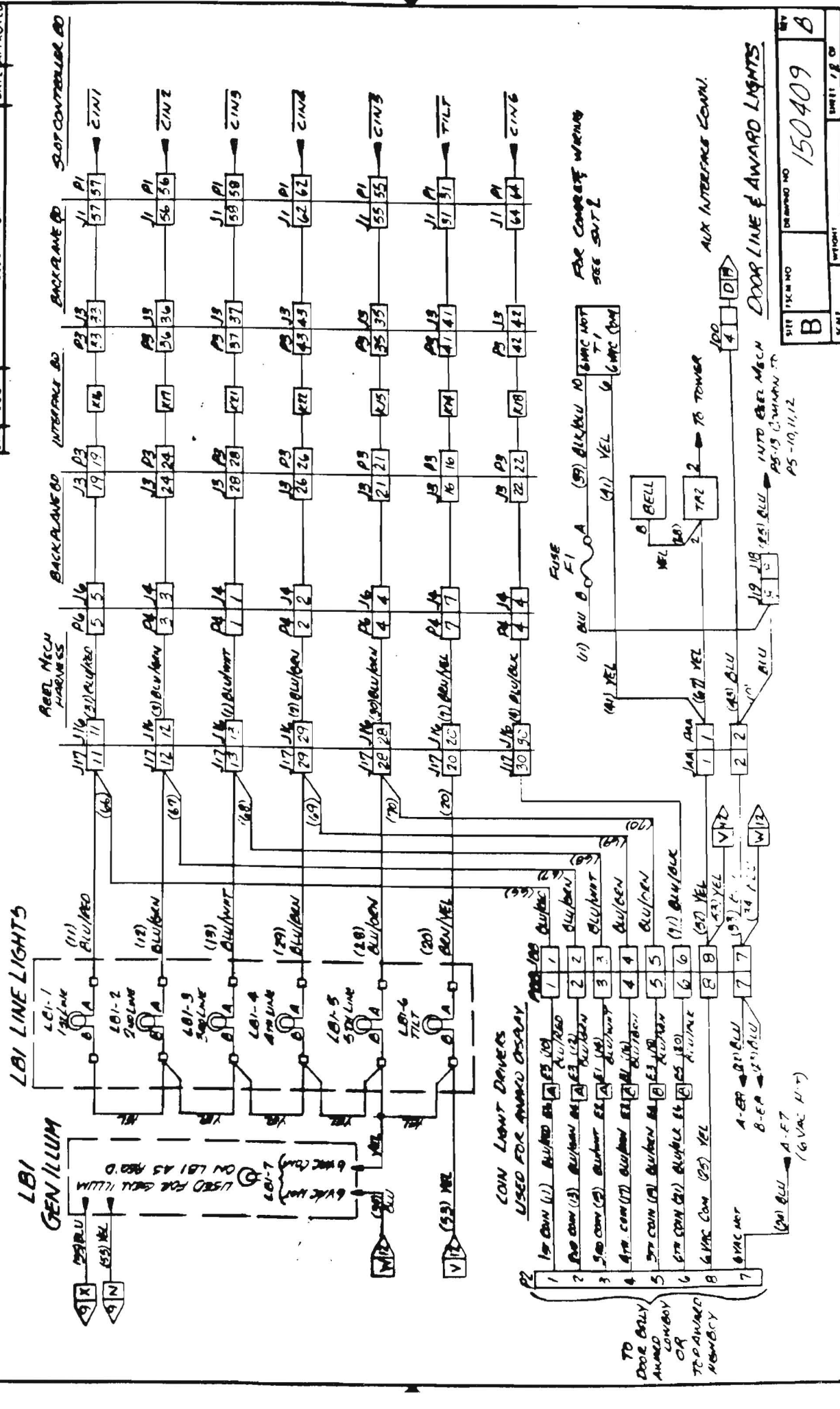
REEL MECH



FLUORESCENT LIGHTING

SHEET NO	DRAWING NO	BY
B	150409	B
SCALE	WEIGHT	SHEET / OF

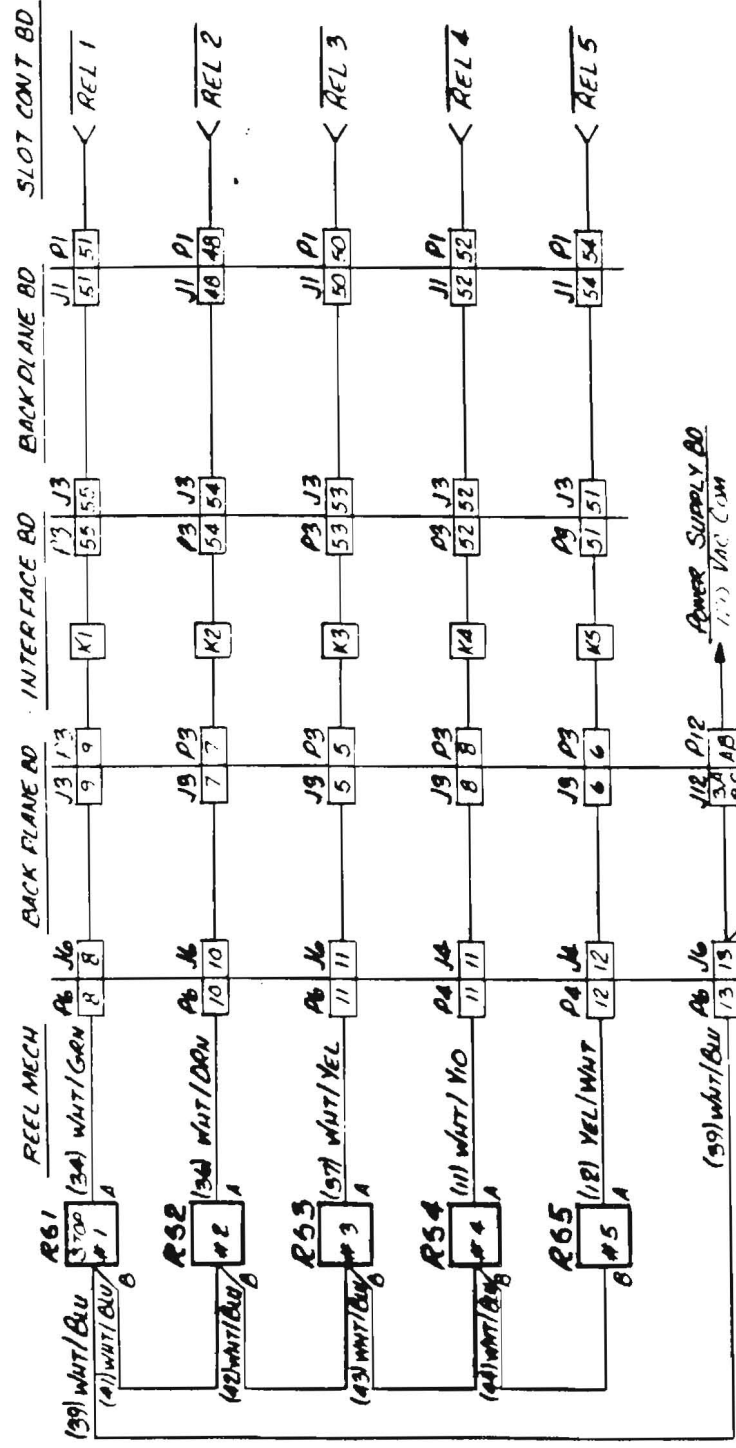
REV	ECO	DESCRIPTION	DATE APPROVED



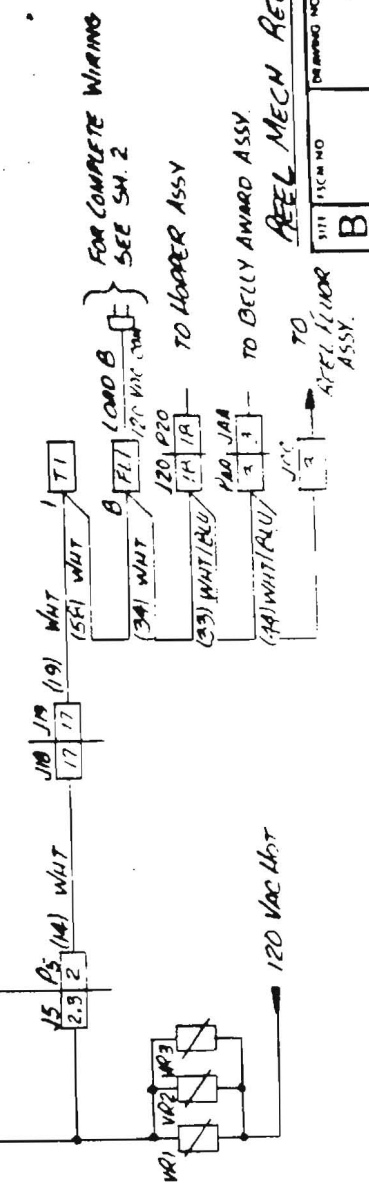
REV	ECO	DESCRIPTION	DATE APPROVED

SHEET NO	DRAWING NO	SCALE	UNIT / 8
B	150409		

REEL STOPS



POWER SUPPLY BD



FOR COMPLETE WIRING
SEE SM. 2

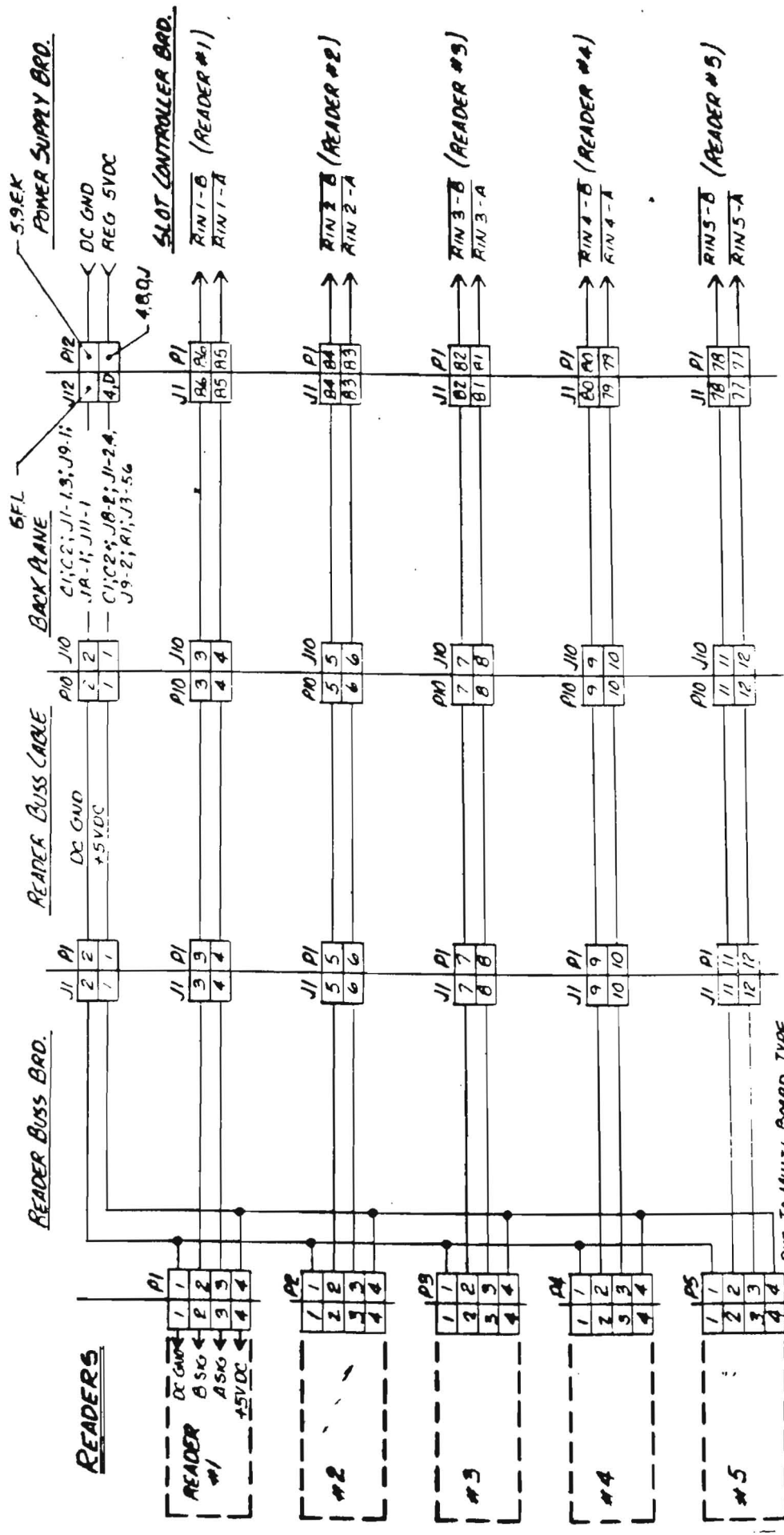
TO HOOPER ASSY

TO BELLY AWARD ASSY.

TO REEL MECH ASSY.

REEL MECH REEL STOPS

REVISIONS		DATE APPROVED
SYM	ECO	
DESCRIPTION		



DUE TO MULTI BOARD TYPE WHEN ALL REELS ARE NOT USED UNUSED READER ARE TIED TO UNUSED READER PER F.W.B.

REEL SPIN SENSE AND HEADERS

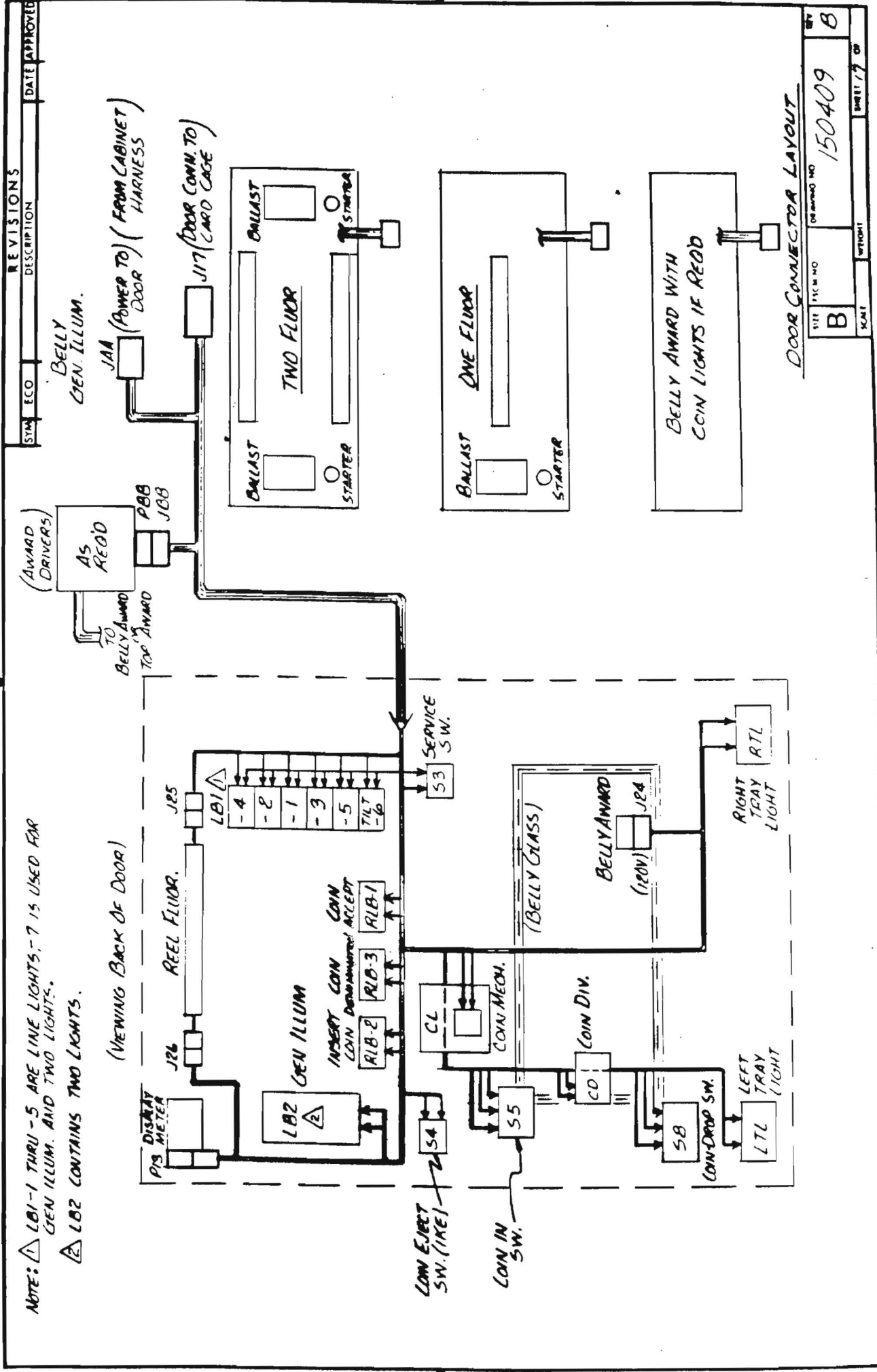


NOTE: SPIN SWITCH IS SHOWN IN SAME TOLE COMP. DRAWING.

REV	DATE	DESCRIPTION	BY
B			
REV	DATE	DESCRIPTION	BY
B			

150409

1/5 OF

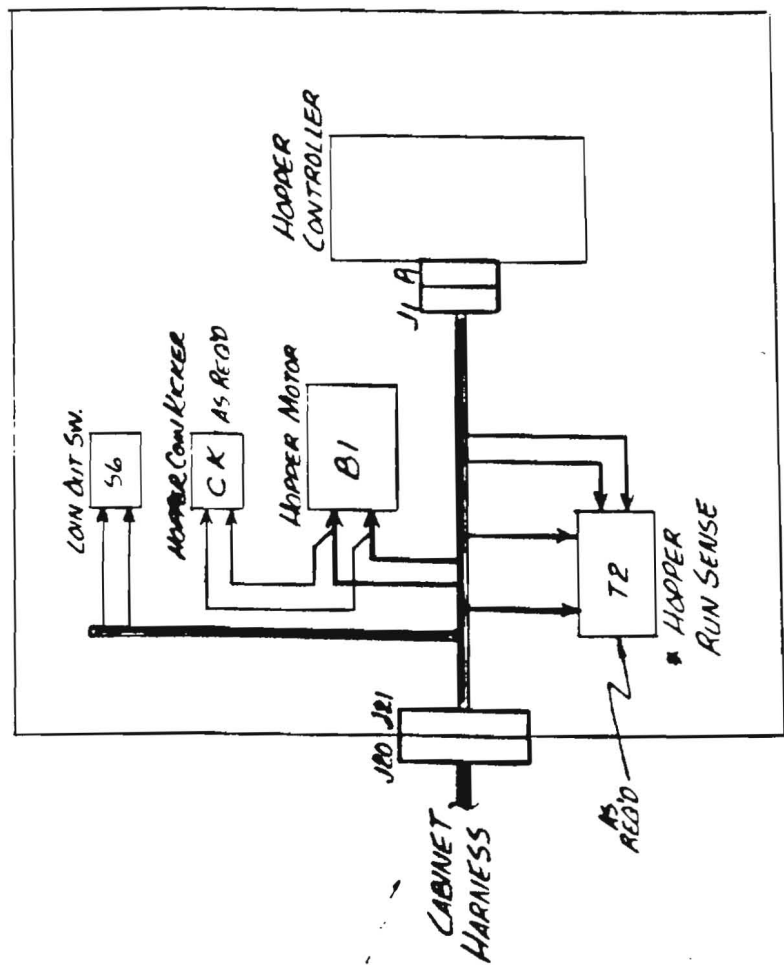


SYMBOL	ECO	REVISIONS	DESCRIPTION	DATE	APPROVED

DOOR CONNECTOR LAYOUT

SIZE	FIG. NO.	OR. APPROV. NO.	REV.
B		150409	B
SCALE	SHEET 17 OF		

REVISIONS		DATE APPROVED
SYM	ECO	DESCRIPTION



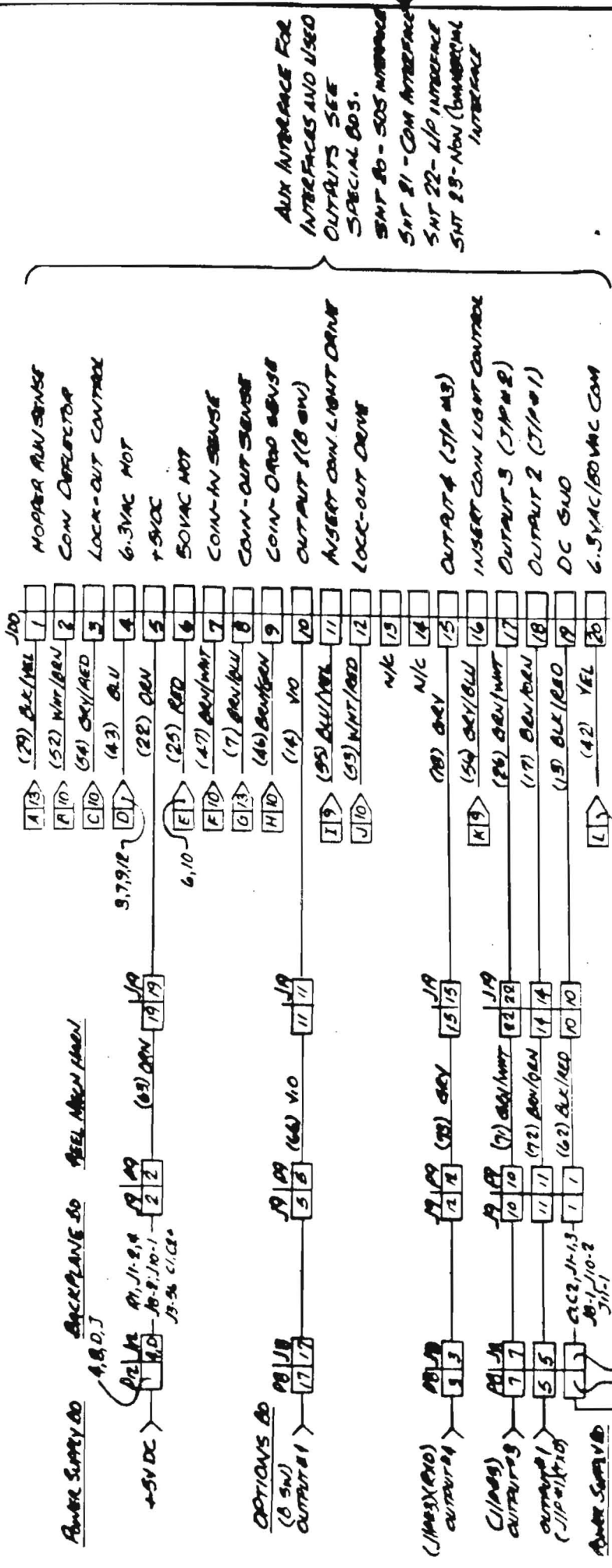
HOPPER HARNESS

HOPPER CONNECTOR LAYOUT

SHEET NO	OF SHEETS	DATE
B	150409	0
SCALE	BY	CHK'D
	WTGHT	DATE

SYM	ECO	REVISIONS	DATE	APPROVED
		DESCRIPTION		

AUX INTERFACE CONN.



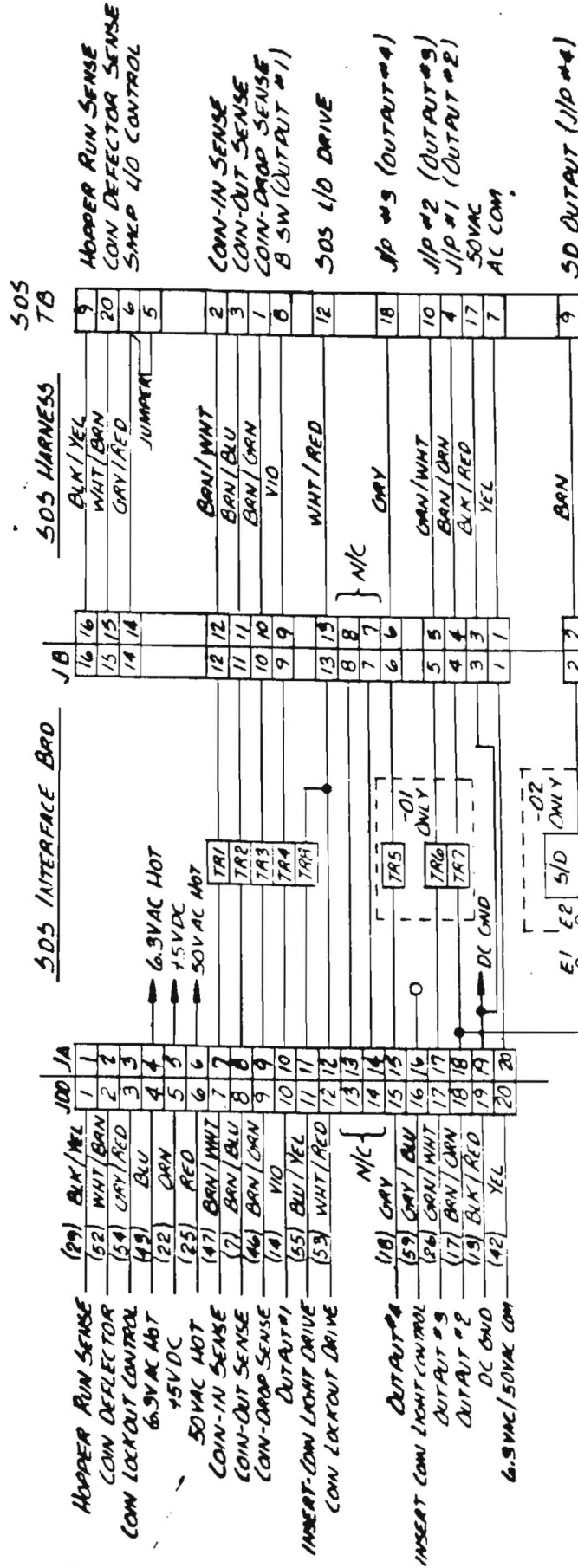
- HOOPER RUN SENSE
- CON DEFLECTION
- LOCK-OUT CONTROL
- 6.3VAC MOT
- 5VDC
- 50VAC MOT
- COIN-IN SENSE
- COIN-OUT SENSE
- COIN-ORAD SENSE
- OUT PUT 1 (B ON)
- INSERT COIN LIGHT DRIVE
- LOCK-OUT DRIVE
- OUTPUT 4 (T/P M3)
- INSERT COIN LIGHT CONTROL
- OUTPUT 3 (T/P M2)
- OUTPUT 2 (T/P M1)
- DC GND
- 6.3VAC/100VAC COM

AUX INTERFACE FOR INTERFACES AND USED OUTPUTS SEE SPECIAL B05.
 SMT 20 - SOS INTERFACE
 SMT 21 - COM INTERFACE
 SMT 22 - L/P INTERFACE
 SMT 23 - NON (INTERNAL INTERFACE)

AUXILIARY INTERFACE CONNECTOR

SHEET NO	REV
B	B
SCALE	DESCRIPTION
	150409
	SHEET 19 OF

SYM	ECO	REVISIONS	DATE	APPROVED

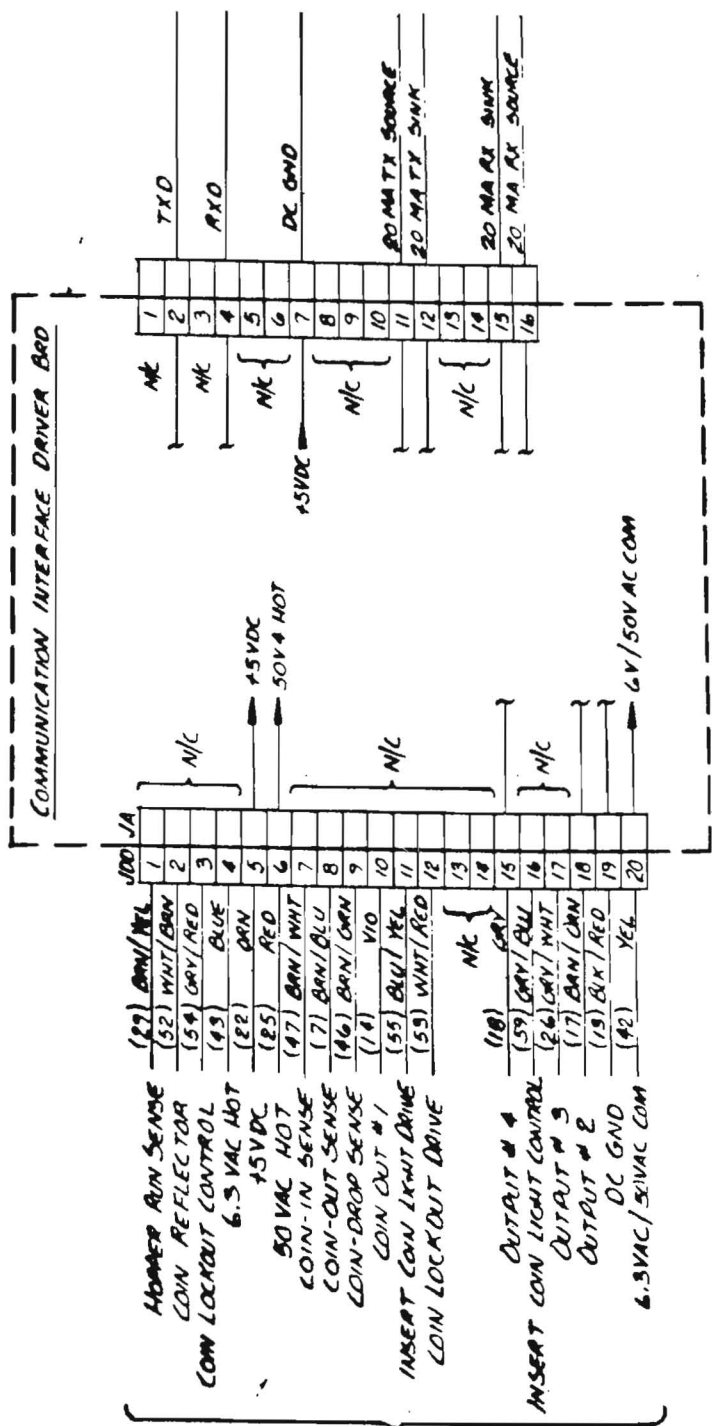


SDS INTEAFACE.

REV	8
DRAWING NO	150409
DATE	
BY	
CHECKED	
APPROVED	

SEE SHEET 19

SYM	ECO	REVISIONS	DESCRIPTION	DATE APPROVED

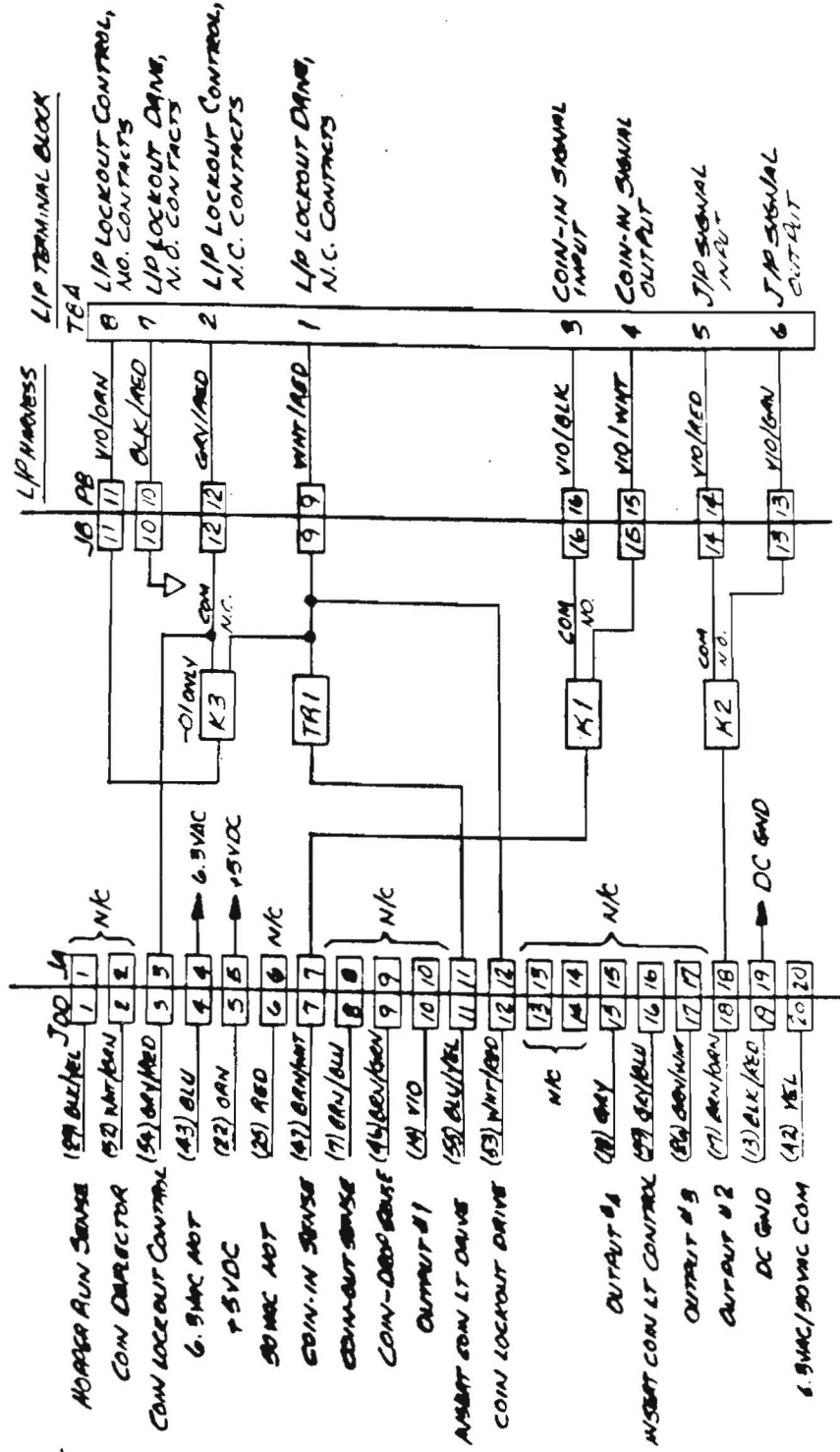


SEE SHIT 19

COMMUNICATION INTERFACE

SCALE	WEIGHT	SHEET 8/15
B	150409	
SITE	PKG NO	DRAWING NO
		8

SYM	ECO	REVISIONS	DATE	APPROVED
		DESCRIPTION		



-01 L/P DRIVER, COIN LOCKOUT N.O.
 -02 L/P DRIVER, COIN LOCKOUT N.C.

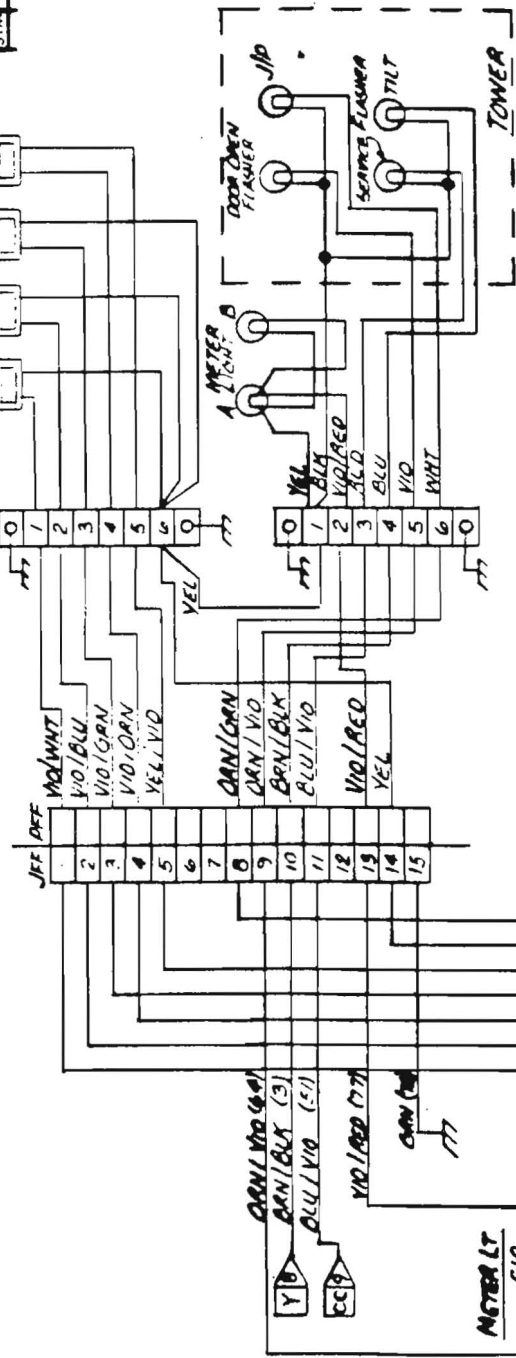
LINKED PROCESSING INTERFACE

SHEET NO	DRAWING NO	REV
B	150409	B
SCALE	SYMBOL	DATE
		11/28/50

SEE SHEET 19

REV	ECO	DESCRIPTION	DATE	APPROVED

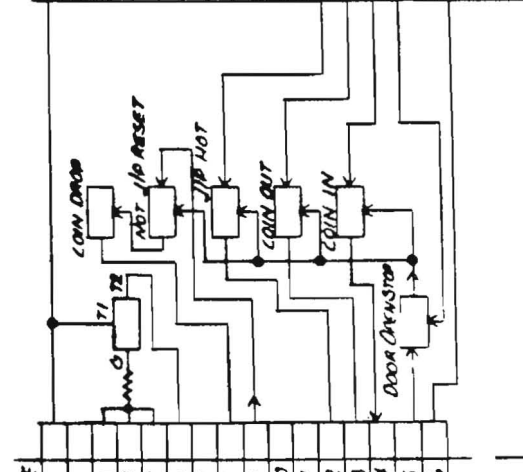
COIN IN, COIN/VT, COIN/APP, JIP



FOR COMPLETE WIRING SEE SM. 2

FOR COMPLETE WIRING SEE SM. 3

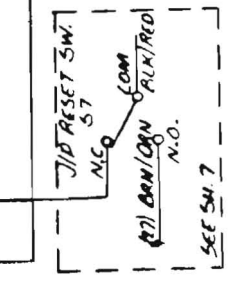
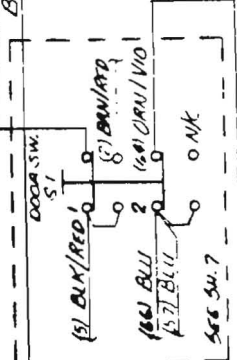
JIP	(48) YEL	6.3 WAC / 50VAC COM	J19-10
20	(15) BLK/RED	DC GND	J19-14
19	(17) BRN/ORN	OUTPUT #2	J19-22
18	(26) GRN/WHT	OUTPUT #3	J19-22
17	(59) GRN/BLU	INSERT COIN LOCK CONTROL	PAA-15
16	(18) GRN	OUTPUT #1	J19-15
15			
14			
13			
12	(85) WHT/RED	COIN LOCK/OUT DRIVE	PAA-12
11	(65) BLU/YEL	INSERT COIN LOCK DRIVE	PAA-14
10	(74) VIO	OUTPUT #1	J19-11
9	(7) BRN/ORN	COIN DROB SENSE	PAA-5
8	(7) BRN/BLU	COIN OUT SENSE	J19-6
7	(87) BRN/WHT	COIN IN SENSE	PAA-6
6	(25) RED	50VAC HOT	J19-21
5	(22) GRN	±50VDC	J19-19
4	(43) BLU	6.3VAC AGT	PAA-2
3	(52) WHT/GRN		PAA-11
2	(29) BLK/YEL	APPAR. RUN SENSE	J20-5
1			



DATE	APPROVED

NON-COMMERCIAL INTERFACE
 SITE EXCH. NO. 150409
 DE WIRING NO. B
 SCALE 1:1
 SHEET 23 OF 24

METER DRIVER BOARD



SEE SH. 7

Located at the right-hand side of the cabinet reel mechanism shelf. P19 is the corresponding plug mounted in the Reel Mechanism assembly.

<u>J19</u>			
PIN NO.	WIRE NO.	WIRE COLOR	DESCRIPTION
PIN 1	1	ORN/GRN	J/P BELL/TOWER
2	2	BRN/RED	DOOR OPEN DETECT; SMCP
3	3	BRN/BLK	H/P J/P TOWER
4	--	---	--
5	4,5	BLK/RED	DC GND
6	6,7	BRN/BLU	COIN-OUT
7	8,9	YEL	6VAC/50VAC COM
8	10,11	BLU	6VAC HOT
9	12	GRY/YEL	HANDLE RELEASE
10	13	BLK/RED	DC GND
11	14	VIO	B-SW
12	15	WHT/BLK	HOPPER RUN
13	16	WHT/GRY	HOPPER SAFE
14	17	BRN/ORN	TXD, J/P#1
15	18	GRY	RXD, J/P#3
16	--	---	--
17	19	WHT	120VAC COM
18	20,21	BLK &	110VAC HOT
19	22	ORN	+5VDC
20	--	---	--
21	24,25	RED	50VAC HOT
22	26	GRN/WHT	J/P#2
23	--	---	--
24	27	BRN/GRN	J/P RESET, DROP SW

Located on the floor of the cabinet behind the hopper slides. P20 is the corresponding plug mounted in the Hopper Mechanism assembly.

<u>J20</u>			
PIN NO.	WIRE NO.	WIRE COLOR	DESCRIPTION
PIN 1	4,28	BLK/RED	DC GND, J/P RESET SW
2	6	BLK/BLU	COIN-OUT
3	29	BLK/YEL	HOPPER RUN SENSE, 50VAC
4	--	---	--
5	--	---	--
6	30	YEL	6VAC/50VAC COM
7	--	---	--
8	--	---	--
9	--	---	--
10	32	BLK	120VAC HOT
11	--	---	--
12	--	---	--
13	--	---	--
14	--	---	--
15	--	---	--
16	15	WHT/BLK	HOPPER RUN
17	16	WHT/GRY	HOPPER SAFE
18	33,34	WHT/BLU	120VAC COM

Located in the left rear of the cabinet above the reel mechanism shelf. JAA is the corresponding connector and is an integral part of the Door Harness assembly.

<u>PAA</u>			
PIN NO.	WIRE NO.	WIRE COLOR	DESCRIPTION
PIN 1	41,42	YEL	6VAC/50VAC COM
2	10,43	BLU	6VAC HOT
3	33,44	WHT/BLU	120VAC COM
4	21,45	BLK/BLU	120VAC HOT, DOOR
5	46	BRN/GRN	COIN-DROP
6	47	BRN/WHT	COIN-IN
7	48	WHT	120VAC COM, FLUOR. LIGHT A
8	49	WHT	120VAC COM, FLUOR. LIGHT B
9	50	BLK	120VAC HOT, FLUOR. LIGHT C
10	51	BLU/VIO	SERVICE LIGHT TOWER
11	52	WHT/BRN	COIN DELECTOR
12	53	WHT/RED	COIN L/O DRIVE
13	54	GRY/RED	COIN L/O CONTROL
14	55	BLU/YEL	INSERT COIN LIGHT DRIVE
15	56	GRY/BLU	INSERT COIN LIGHT CONTROL

Located at the left-hand side of the reel mechanism shelf. P17 is the corresponding plug mounted in the Reel Mechanism assembly.

<u>J17</u>			
PIN NO.	WIRE NO.	WIRE COLOR	DESCRIPTION
PIN 1	1	GRY	SEG a DISPLAY
2	2	YEL	SEG b DISPLAY
3	3	BRN	SEG c DISPLAY
4	4	RED	SEG d DISPLAY
5	5	ORN	SEG e DISPLAY
6	6	BLU	SEG f DISPLAY
7	7	BLK	SEG g DISPLAY
8	8	WHT	LSD DISPLAY
9	9	GRN	D-1 DISPLAY
10	10	VIO	MSD DISPLAY
11	11,66	BLU/RED	1ST COIN LIGHT
12	12,67	BLU/GRN	2ND COIN LIGHT
13	13,68	BLU/WHT	3RD COIN LIGHT
14	14	BLU/GRY	COIN-ACCEPT
15	15	GRY/BLU	INSERT COIN
16	UNUSED		
17	50	BLK/RED	DC GROUND
18	18,74	BRN/WHT	COIN IN SWITCH
19	UNUSED		
20	20	BRN/YEL	TILT LIGHT
21	21	GRY/RED	COIN LOCKOUT
22	23,73	WHT/BRN	COIN DEFLECTOR
23	76	RED	COIN EJECT (A/R)
24	UNUSED		
25	UNUSED		
26	UNUSED		
27	27,75	BRN/GRN	COIN DROP SW.
28	28,70	BLU/ORN	5TH COIN LIGHT
29	29,69	BLU/BRN	4TH COIN LIGHT
30	71	BLU/BLK	6TH COIN LIGHT

Located at the left side of the cabinet near the rear above the reel mechanism shelf. PCC is the corresponding connector and is an integral part of the Award Light Driver assembly.

<u>JCC</u>			
PIN NO.	WIRE NO.	WIRE COLOR	DESCRIPTION
PIN 1	48	WHT	FLUOR. LIGHT A
2	49	WHT	FLUOR. LIGHT B
3	44, 65	WHT/BLU	120VAC COM
4	45	BLK/BLU	120VAC HOT
5	50	BLK	FLUOR. LIGHT C
6	65	WHT/BLU	120VAC COM

Located at the rear of the cabinet approximately behind the reel center shaft. Used to interconnect with the special meter unit furnished with military machines.

<u>JEE</u>			
PIN NO.	WIRE NO.	WIRE COLOR	DESCRIPTION
PIN 1	76	YEL	6VAC/50VAC COM
2	--	---	--
3	--	---	--
4	1	ORN/GRN	J/P BELL/TOWER LIGHT
5	62	ORN/GRN	J/P BELL/TOWER LIGHT
6	75	YEL/VIO	J/P METER COM
7	--	---	--
8	74	VIO/GRN	COIN DROP METER
9	73	VIO/BLK	J/P RESET SW N.C.
10	--	---	--
11	--	---	--
12	72	VIO/ORN	J/P METER HOT
13	71	VIO/BLU	COIN OUT METER
14	70	VIO/WHT	COIN IN METER
15	69	VIO/BRN	DOOR OPEN SW, METER STOP
16	68	BLU	METER LIGHT SW 6.3VAC

Used with special meter units furnished with military machines located in the meter unit. PFF is the corresponding plug and is an integral part of the Meter assembly.

<u>JFF</u>			
PIN NO.	WIRE NO.	WIRE COLOR	DESCRIPTION
PIN 1	70	VIO/WHT	COIN-IN METER
2	71	VIO/BLU	COIN-OUT METER
3	74	VIO/GRN	COIN-DROP METER
4	72	VIO/ORN	J/P METER HOT
5	75	YEL/VIO	J/P METER COM
6	--	---	
7	--	---	
8	67	ORN/GRN	J/P TOWER LIGHT
9	64	ORN/VIO	DOOR OPEN TOWER LIGHT
10	3	BRN/BLK	H/P J/P TOWER LIGHT
11	51	BLU/VIO	SERVICE TOWER LIGHT
12	--	---	
13	77	VIO/RED	METER LIGHT
14	76	YEL	6VAC/50VAC COM
15	78	GRN	SAFETY GND

Located at the rear of the cabinet approximately behind the reel center shaft. Connects to a variety of special interface PCB assemblies for use with special features.

<u>JDD</u>			
PIN NO.	WIRE NO.	WIRE COLOR	DESCRIPTION
PIN 1	29	BLK/YEL	HOPPER RUN SENSE, 50VAC
2	52	WHT/BRN	COIN DEFLECTOR
3	54	GRY/RED	COIN LOCKOUT CONTROL
4	43	BLU	6.3VAC HOT
5	22	ORN	+5VDC
6	25	RED	50VAC HOT
7	47	BRN/WHT	COIN-IN
8	7	BRN/BLU	COIN-OUT
9	46	BRN/GRN	COIN-DROP
10	14	VIO	B SW
11	55	BLU/YEL	INSERT COIN DRIVE
12	53	WHT/RED	COIN LOCK OUT DRIVE
13	--	---	---
14	--	---	---
15	18	GRY	J/P #3
16	56	GRY/BLU	INSERT COIN CONTROL
17	26	GRN/WHT	J/P #2
18	17	BRN/ORN	J/P #1
19	13	BLK/RED	DC GND
20	42	YEL	6VAC/50VAC COM

APPENDIX

2

Service Bulletins

SMCP INFORMATION BULLETIN INDEX

2/4/82

Revision: B

Bulletin No.	Subject	Issue Date
001	REEL SPIN AND INDEX ARM SPRINGS	11/24/81
002 A	DRIVE LINK-BACKPLANE CONNECTOR INTERFERENCE	1/19/82
003 A	REEL SOLENOIDS AND ALIGNMENT	1/11/82
<u>004 A</u>	READER ALIGNMENT METHODS	<u>2/4/82</u>
005	SLOT CONTROLLER BATTERY TEST	12/1/81
006 A	LEFT SIDE PLATE REEL SHAFT WEAR	1/11/82
007	FAST PULL ADJUSTMENTS	1/11/82
<u>008</u>	<u>ELECTROMECHANICAL COIN-IN METER</u>	<u>2/4/82</u>
009	CARE AND FEEDING OF HOPPERS	5/26/83

Remove and discard previous Revision Bulletins. Replace with the attached Revisions and add the New Releases. Changes are identified by an underscore or vertical line to left of typed body.

SMCP INFORMATION BULLETIN

Bulletin No. 001

Issue Date: NOVEMBER 24, 1981

Subject: REEL SPIN AND INDEX ARM SPRINGS

The SMCP is designed to provide accurate indexing over a wide range of reel spin speeds. However, it is possible to exceed the read and index limits by using wrong or modified spin springs. The purpose of this bulletin is to identify the proper springs for each type of machine and warn against the dangers of deviating from the standard.

Optimum reel spin speed is 95-110 RPM for 20, 22 and 25 position machines. This provides the shortest name time with maximum accuracy without significant increase in mechanical wear when properly maintained.

The following springs have been designed specifically for the applications noted. At no time should a spring be shortened or modified in any way. If a spring becomes defective it must be replaced.

Reel Spin Springs:

<u>Machine Type</u>	<u>Summit Part No.</u>	<u>Color Code</u>
3 Reel (A11)	120230	Red
4 Reel (A11)	120231	Yellow
5 Reel (A11)	120232	Blue

To provide positive indexing and prevent mechanical failure of wiper arm assembly, the index arm return spring listed below must be used in conjunction with any of the above spin springs.

	<u>Summit Part No.</u>	<u>Color Code</u>
Index Arm Spring	120233	Red

Index arm spring P/N 120233 is designed to absorb the additional energy stored in the faster spinning reels rather than the index arm stop tab on the wiper arm assembly. If not used, this tab will break in time and require replacement of wiper arm assembly.

Bally index arm spring (red), P/N SP-100-292, may be used interchangeably with Summit P/N 120233.

The Bally spin spring (red), P/N SP-100-268 is not recommended for use on 3 reel machines. Under certain conditions repeated over indexing may result, affecting machine performance.

SMCP INFORMATION BULLETIN

Bulletin No. 002 A

Issue Date: JANUARY 19, 1982

Subject: DRIVE LINK - BACKPLANE CONNECTOR INTERFERENCE

As a result of tolerances and the fact that the Drive Lever assembly (Kicker) floats on the shaft, the Drive Links nearest the Card Cage Backplane connectors may occasionally hit a connector and eventually damage the connector body. This condition may occur on 3, 4 or 5 narrow reel mechanisms.

If the above condition is evidenced, correct by reversing the Drive Link that interferes. Install with the slotted end rearward. This procedure retains the proper function of the Drive Link and provides ample clearance around the connectors.

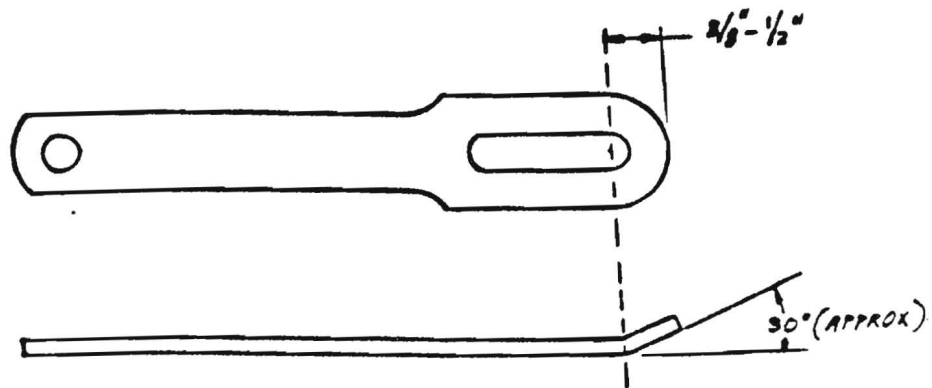
It is recommended that the appropriate Links be installed in this manner on new SMCP installations on narrow reel machines.

CAUTION:

The new style Drive Links, which are wider on the slotted end, may contact the Toggle Stop Rod in the rest position. Depending on part tolerances, this may affect the Trip Point setting and/or reel spin.

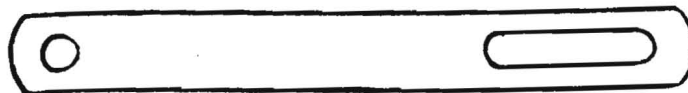
If the Stop Rod is being bent downward or the above conditions are evidenced, correct by using "old style" (straight) Drive Links installed reverse manner, if they are available. If old style Links are not available, modify new style links by bending the link end as illustrated and install in normal orientation.

NEW STYLE DRIVE LINK



1. PLACE LINK IN VISE UP TO DASHED BEND LINE
2. STRIKE EXPOSED TIP WITH HAMMER TO OBTAIN BEND
3. INSTALL MODIFIED DRIVE LINK WITH SLOTTED END FORWARD (NORMAL ORIENTATION) AND BEND TO THE RIGHT AS VIEWED FROM THE FRONT OF REEL MECH

OLD STYLE DRIVE LINK



1. INSTALL REVERSED (SLOTTED END REARWARD), NO MODIFICATIONS REQUIRED.

ILLUSTRATION NO. 2 - BULLETIN 002A

SMCP INFORMATION BULLETIN

Bulletin No. 003 A

Issue Date: JANUARY 11, 1982

Subject: REEL SOLENOIDS AND ALIGNMENT

There are two manufacturers of solenoids used in the SMCP; AMF-Potter Brumfield and Guardian. Do not intermix plungers and solenoid bodies as they are not identical. The AMF plunger must be used only with AMF solenoids and Guardian only with Guardian. This is easy to verify and should be checked when reel mech removal is permissible. The AMF plunger has a groove cut around the circumference just below the slot for the linkage. Guardian plungers do not have this groove. Guardian solenoids have their logo (shield with a "G") stamped on the top surface. AMF solenoids are plain on top. If you find the wrong plunger installed, replace it with the correct one. When replacing a reel solenoid, always replace the plunger and linkage at the same time.

Verify that all reel solenoids are Intermittent Duty type, not Continuous Duty. This can be verified by looking at the part number on the body. The AMF-Potter Brumfield should be S28-25-A type, not S28-100-A. The Guardian should be 28-INT-120VAC type, not 28-C-120VAC. If the continuous duty type is found, replace it as soon as possible with intermittent duty type. The pull force on the continuous duty type is too marginal for positive activation.

The continuous duty types are only to be used in the early Handle Release assembly, Part Number 150055, but may have been used to replace a defective Reel Solenoid by a mechanic who was unaware of the difference.

To optimize machine performance and simplify reel solenoid alignment, the attached procedure should be used in conjunction with a special tool No. T1032A.

Special tool No. T1032A when properly used, will make it easy to adjust the solenoid stroke to the optimum setting of .145 inches.

Install the Latch Pawl Return spring to the pin closest to the shaft, not to the pin where the solenoid linkage attaches. This significantly reduces the load on the solenoid, which results in a more positive activation. Place 3/16" "E" rings on both sides of linkage to prevent it from moving sideways and binding in a groove.

Some Bally Latch Pawl assemblies will be found to have 4 grooves instead of 3 in the Solenoid Linkage Pin. These do not allow proper spacing be-

SMCP INFORMATION BULLETIN

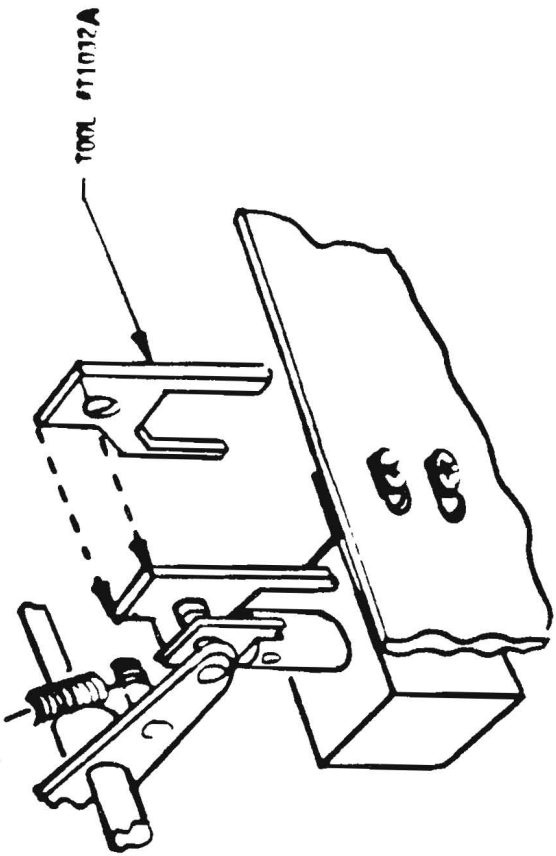
Bulletin No. 003 A

Issue Date: JANUARY 11, 1982

Subject: REEL SOLENOIDS AND ALIGNMENTS

2.

tween "E" rings on either side of Linkage which assures straight pull and constant stroke length. To correct this condition on the 4 groove types, install a #10 small pattern flat washer (Part Number 214-02005) after the Linkage and before the second "E" ring. This will remove the play and prevent the Linkage from working into a groove thus changing the actual stroke length.



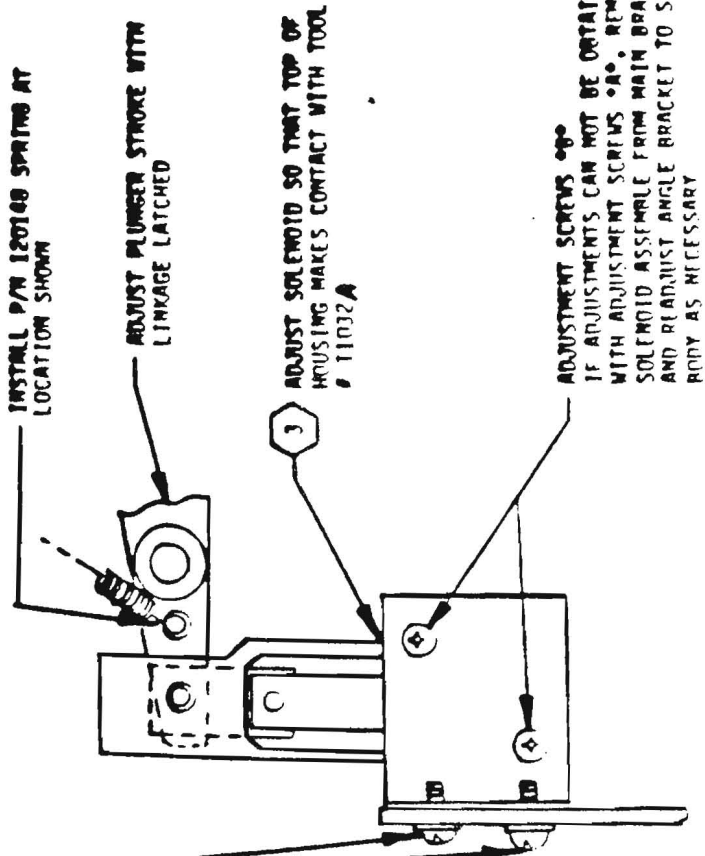
TOOL #11032A

1 ADJUST SOLENOID CENTER WITH CENTER OF PLUNGER LINKAGE

INSTALL E RINGS ON BOTH SIDES OF PLUNGER LINKAGE P/N 510014

ADJUSTMENT SCREWS "A" FOR ITEMS 1, 2, 3

SOLENOID BODY SHOULD BE PARALLEL WITH TOP OF MAIN BRACKET (BUT NOT NECESSARILY FLUSH)



INSTALL P/N 120140 SPRING AT LOCATION SHOWN

ADJUST PLUNGER STROKE WITH LINKAGE LATCHED

ADJUST SOLENOID SO THAT TOP OF HOUSING MAKES CONTACT WITH TOOL # 11032A

ADJUSTMENT SCREWS "B" IF ADJUSTMENTS CAN NOT BE OBTAINED WITH ADJUSTMENT SCREWS "A". REMOVE SOLENOID ASSEMBLY FROM MAIN BRACKET AND READJUST ANGLE BRACKET TO SOLENOID BODY AS NECESSARY

SMCP INFORMATION BULLETIN

Bulletin No. 001 A

Issue Date: FEBRUARY 4, 1982

Subject: READER ALIGNMENT METHODS

To assure proper Reader Alignment is achieved and maintained, utilize the appropriate procedures below. Prior to making any adjustments, verify the following items which will ensure continued alignment.

1. External tooth star washers are installed on all 5 Front Panel mounting screws.
2. Mounting screws are tight and a minimum of 2 threads protrude beyond Front Panel nuts.
3. Split Lock washers are installed on all Reader-To-Bracket and Bracket-To-Front Panel screws.
4. Reel Shaft Lock Lever on left Side Plate does not protrude more than .25 inches above top edge of Side Plate with Reel Shaft properly installed. This generally indicates that the Reel Shaft notch in Side Plate has excessive wear and may affect ability to maintain proper Reader Alignment.

If the Left Side Plate does not meet the criteria in item 4 above, install a Reel Shaft Support bracket, Summit Part Number 120265 per Information Bulletin 006.

READER ALIGNMENT PROCEDURE - IN SERVICE

1. Ensure Reader assemblies are centered and parallel to Reel Discs. Adjust with Front Panel Reader screws and bending Reader Bracket slightly as necessary. Do not force Reader Assembly against Disc, remove Reels if necessary. Tighten Front Panel Reader screws.
2. Open door and depress Hopper Fill switch on Power Supply Module. Win Meter should display "1-0" thru "1-3". The first number is the reader number from left to right. The second number is the reel code (0 thru 3).
3. If meter is displaying a "0, -1, or -2", push Index Arm out of Reel Disc and rotate the Reel forward until meter displays "-3". Allow Index Arm to return to notch for -3 Code.
4. Place a ruler (or Special Tool T1033) on top of Front Panel and parallel to reel No. 1 (See Illustration No. 1). Make a thin horizontal pencil line on the reel edge directly across from the 3 1/2" mark on ruler (top reference line on Tool T1033).

SMCP INFORMATION BULLETIN

Bulletin No. 004A

Issue Date: FEBRUARY 4, 1982

Subject: READER ALIGNMENT METHODS

READER ALIGNMENT PROCEDURE - IN SERVICE Cont'd.

5. Slowly rotate the Reel downward until the meter changes. Note distance mark on Reel has moved. Should be $\frac{3}{16}$ " (min. mark on T1033) to $\frac{5}{16}$ " (max. mark on T1033). Optimum is $\frac{1}{4}$ " (mark between min. and max. on T1033).
6. If distance is less than $\frac{3}{16}$ " move Reader down slightly at Reader P C Board to Bracket junction, not Bracket to Front Panel screws.
7. If distance is greater than $\frac{5}{16}$ " move Reader P C Boards up slightly.
8. Depress Hopper Fill Switch. Meter should now display "2-0" thru "2-3".
9. Repeat steps 3 thru 8 for all remaining Reels.
10. Carefully tighten all Reader P C Board screws and re-check to assure Readers are still within limits. Seal screw head to P C Board with dab of nail polish on outside edge, not in slots.

READER ALIGNMENT PROCEDURE WITH PRECISION READER ADJUSTMENT FIXTURE

Requirements

The Precision Reader Adjustment Fixture (Summit Part Number T1040), consists of a metal disc similar to the SMCP Reel Index Disc. The disc must be mounted on a Standard Reel-Hub assembly, complete with bearings, and is assembled on a blank reel-shaft so that it can slide from side to side reaching all reader positions. Since there are a variety of reel-shaft lengths necessitated by different 3, 4, and 5 reel mechanisms, it is recommended that a selection of blank reel-shafts be reserved for this operation.

The Precision Reader Adjustment Fixture is arranged with 3 different notches marked "20", "22", and "25" respectively. The fixture is inserted in the reader in the same way the SMCP Reel Index Disc is positioned and rotated until the appropriate stop-notch, depending on whether the reel mechanism is a 20, 22, or 25 stop unit, then the index arm is released and engaged in the appropriate stop-notch. This positions two small holes which are located precisely in correct relationship to the stop-notch. When the reader assembly is adjusted so that the reader transistors are exactly aligned with these holes, reader operation will be optimal and the need for field adjustment will be greatly minimized.

SMCP INFORMATION BULLETIN

Bulletin No. DDA A

Issue Date: FEBRUARY 4, 1982

Subject: READER ALIGNMENT METHODS

Procedure Using Slot Simulator

Insert the Slot Simulator Assembly in place of the Slot Controller and power-on. Observe the "A" and "B" lamps on the slot simulator associated with the reader position being adjusted. If both the A and B indicators are extinguished, the reader is mispositioned by a major amount. If either the A or B indicators are illuminated, only a minor adjustment is needed. If both the A and B indicators are lit simultaneously (without rotating the test fixture), reader alignment is optimal. Repeat the check and adjustment for each reel until all readers are adjusted properly. Remove the test fixture.

Procedure Using Built-In SMCP Reader Diagnostic

Set the Reader Adjustment Fixture in the Reel 1 reader and engage the Index-arm in the appropriate stop-notch (20, 22, or 25). Power the SMCP with the Slot Controller installed. Since the game personality does not influence the diagnostic operation, for the purposes of reader alignment, any convenient SMCP EPROM can be used provided it is for a machine with at least as many reels as the mechanism under test.

Condition the SMCP to an "idle" state, i.e., no coin-in no payout pending and depress the Hopper-Fill button on the front panel. Observe the game Win Meter display: the display should be "1-X"; where the "X" will be a 0, 1, 2, or 3. If the display is 1-3, the reader is accurately aligned. If the display is 1-0, the reader is significantly out of adjustment. If the display is 1-2 or 1-1, the misadjustment is minor.

After obtaining a "3" reading, move the Reader Adjustment Fixture to the Reel 2 reader then depress the Hopper-Fill button once. The Win Meter display should be "2-X", where the X value 0, 1, 2, or 3 again indicates the alignment of this reader.

Proceed in this fashion: (a) set the test fixture in a reader, (b) depress the Hopper-Fill button, and (c) adjust until all readers are aligned.

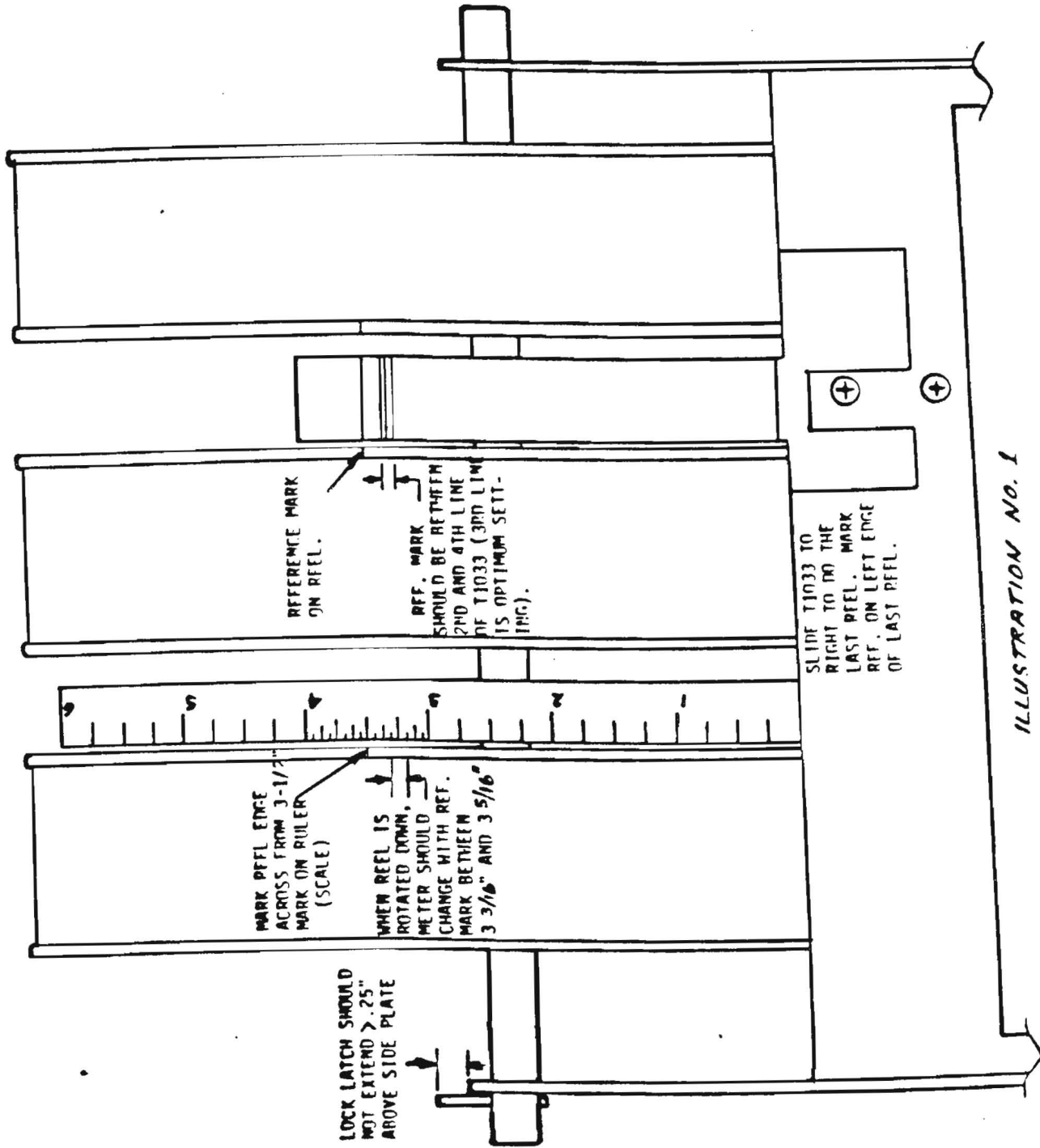


ILLUSTRATION NO. 1

BULLETIN 004A

SMCP INFORMATION BULLETIN

Bulletin No. 005

Issue Date: December 1, 1981

Subject: SLOT CONTROLLER BATTERY TEST

It is recommended that the following test be made on any Slot Controller Battery that is suspected as defective and at 12 month intervals on all Batteries:

1. Record all meter readings prior to performing test.
2. After at least 14 consecutive hours of power - on condition, remove the Slot Controller PCB assembly and measure the voltage across the battery with a DC Voltmeter with at least 1,000 ohm per volt impedance. The Battery voltage must be at least 3.7 volts.
3. Connect a 51 ohms, minimum 1/2 watt resistor across the battery. Measure the voltage with the load connected, it should be at least 3.2 volts.
4. If Battery fails either step 2 or step 3, replace it and allow the new battery to charge for at least 14 hours (power-on condition). Repeat both tests on new battery. If new battery fails either test, return the Slot Controller PCB Assembly to Summit for repair.

CAPACITY TEST

1. Ensure battery has been charged for minimum of 14 hours. Remove PCB from unit.
2. Connect a 150 ohm, minimum 1/4 watt, resistor across the battery. Measure the voltage after one hour with the resistor connected. If the voltage reading is 2.0 volts or less, replace the battery.

SYMPTOMS OF DEFECTIVE BATTERY

1. Game status and/or meter readings are lost after power interrupt.
2. Battery will not charge to more than 2.8 volts. This indicates one or more dead cells in battery.
3. Fails any of the above tests.

SMCP INFORMATION BULLETIN

Bulletin No. 006 A

Issue Date: JANUARY 11, 1982

Subject: LEFT SIDE PLATE REEL SHAFT WEAR

A major weak point in all Bally Reel Mechanisms is the rapid wear of the Left Side Plate at the Reel Shaft bearing surface. This is a result of repeated hammering from the kicker and Index Arm action and the fact that this surface is only .09 inches wide and very soft metal. The right side does not exhibit this problem because of the hardened steel piece that is added to prevent Reel Shaft rotation.

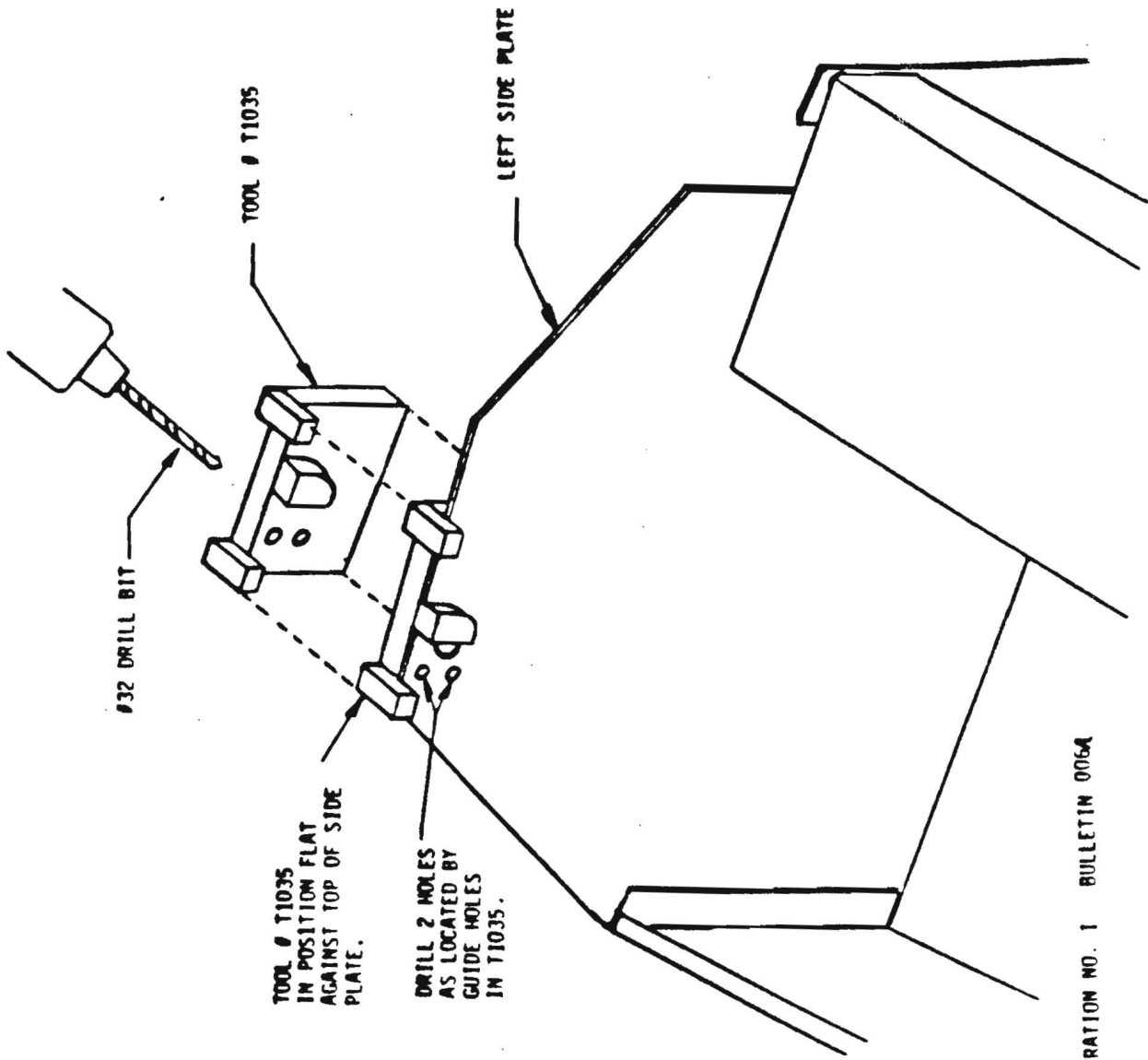
The effects of excessive wear are:

1. Reader alignment cannot be properly maintained.
2. Lock Latch no longer holds Reel Shaft in position (can rotate past Reel Shaft).

To correct this condition without the expense and labor of replacing the complete side plate, install Summit Part Number 120265 Left Side Plate Reel Shaft Support piece according to the following procedure. This renews this portion of the side plate and outlasts the original material many times over.

PROCEDURE

1. Remove Reel Shaft from Reel Mech.
2. Place rag over Reel Mech such that only top portion of Left Side Plate is exposed. This is to prevent metal chips from falling into mechanism.
3. Install Drill Guide Tool T1035 as shown in Illustration No.1 and drill the two .116 inch diameter holes (No. 32 drill bit) through Side Plate.
4. Remove Drill Guide Tool and deburr the holes.
5. Carefully remove the rag with metal chips. Inspect for and remove any remaining chips.
6. Install Summit Part Number 120265, Left Side Plate Support piece in accordance with Illustration 2.
7. Reinstall Reel Shaft assembly and readjust Readers in accordance with established procedures.



#32 DRILL BIT

TOOL # T1035

LEFT SIDE PLATE

TOOL # T1035
IN POSITION FLAT
AGAINST TOP OF SIDE
PLATE.

DRILL 2 HOLES
AS LOCATED BY
GUIDE HOLES
IN T1035.

ILLUSTRATION NO. 1 BULLETIN 006A

SUMMIT P/N 120265

.116 DIA. DRILLED HOLES
LOCATED BY T1035 TOOL

#4 SPLIT LOCK WASHERS
(2 REQUIRED)

4-40 x 3/8" PAN
HEAD PHILLIPS
SCREENS (2 REQUIRED)

LEFT SIDE PLATE
(EXISTING)

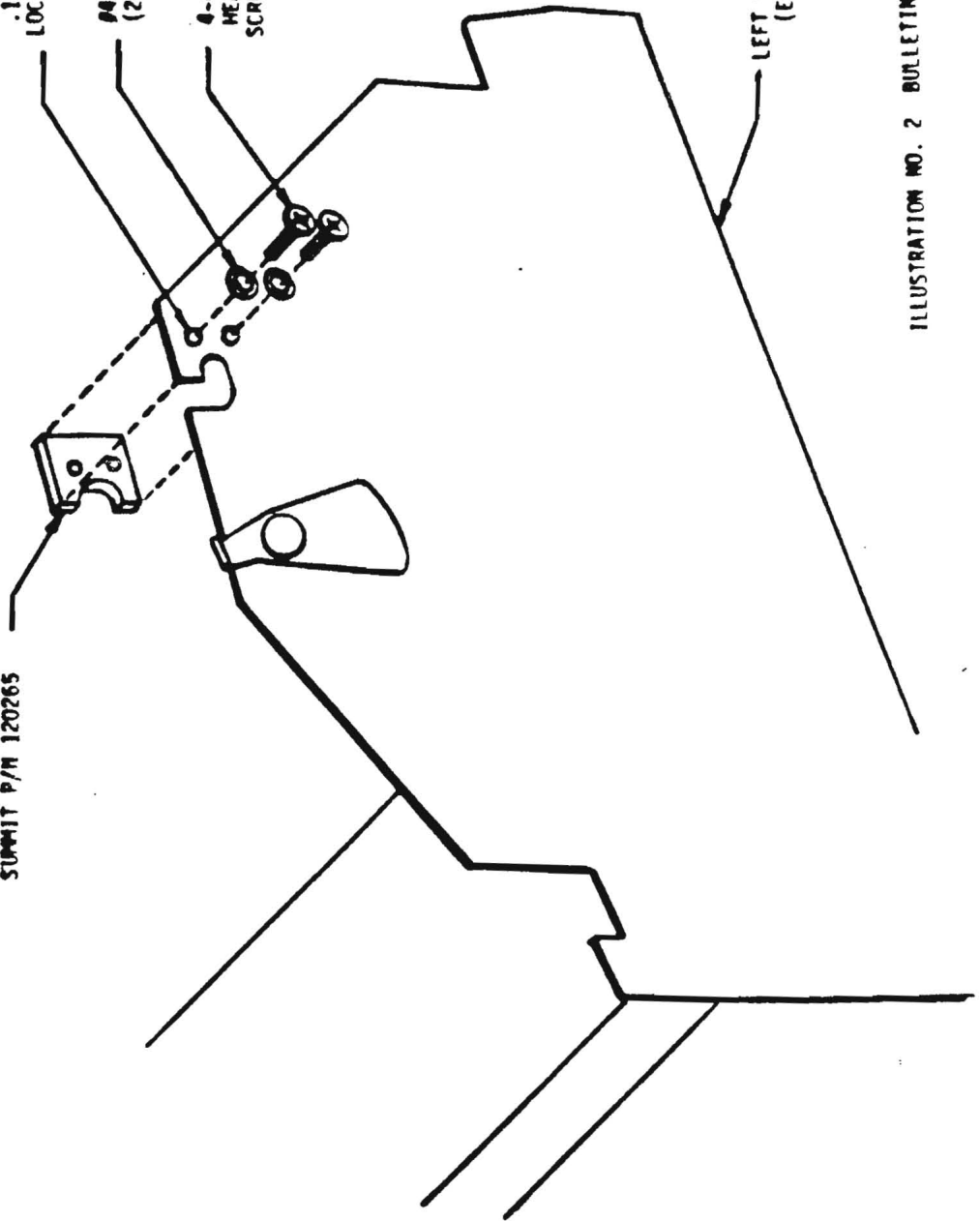


ILLUSTRATION NO. 2 BULLETIN 006A

SMCP INFORMATION BULLETIN

Bulletin No. 007

Issue Date: JANUARY 11, 1982

Subject: FAST PULL ADJUSTMENTS

The SMCP conversion does not eliminate all mechanical parts. Proper performance of a converted machine is still dependent on proper service and adjustment of those parts which remain. Service is greatly simplified but maintenance intervals should be adhered to as prior to the conversion.

One area that is sensitive to improper adjustment or lack of maintenance is the Air Cylinder and Drive Shaft on the Reel Mech. These parts are important safe-guards which must be functioning properly to ensure correct operation of the Reel Mech over a wide range of player handle speeds. As with the standard mechanical Reel Mechanism, improper function of these parts can result in large variations in Reel spin speeds or no spin at all. This will result in unnecessary "Tilt" codes requiring Key person's involvement. Unlike the mechanical version, a "no-spin" on a winner will not result in a second payout, but may lead to a player challenge. These situations can be avoided if the following checks and services are part of initial conversion and included in the normal preventive maintenance program.

1. Place finger over small air hole in end of cylinder and push in Link Assembly. Ensure pressure is held in cylinder for at least 5 seconds with maximum force applied (no further collapsing).
2. Verify hole diameter is not greater than .034 inches. A #64 drill bit end should not fit through.
NOTE: do not use force.
3. Verify that the air hole is not plugged by compressing the Air Cylinder several times. The bleed-off should be smooth and consistent.

The Piston Cylinder should be lightly greased at maintenance intervals. Do not allow old residue to build up in cylinder or air hole; blockage will occur. Replace Neoprene Cup Seal if pressure cannot be retained.

4. Verify that a fast handle pull will result in a noticeable delay in the trip action. If no delay is detected and Air Cylinder is functioning properly, check that the proper Drive Shaft Compression spring is installed and is fully extended (not compressed by second Stop nut adjusted in). Check that Drive Shaft does not bind in

SMCP INFORMATION BULLETIN

Bulletin No. 007

Issue Date: JANUARY 11, 1982

Subject: FAST PULL ADJUSTMENTS

Overtravel Fork. Ensure good lubrication at this point.

5. Ensure the Anti-fast Pull Speed Lock Pawl in the Handle Mechanism is dry and pivots freely. Verify proper adjustment by striking the Handle downward at any point prior to trip. The Speed Lock Pawl should engage the ratchet and prevent the Handle from completing it's stroke. If not, readjust the Fast Pull Adjustment Plate upwards until proper function is achieved.

SMCP INFORMATION BULLETIN

Bulletin No. 008

Issue Date: FEBRUARY 4, 1972

Subject: ELECTROMECHANICAL COIN-IN METERS

The SMCP is designed to drive an electromechanical coin-in meter for those customers that desire a redundant record. This information is recorded, stored and available for display as the first group of numbers in the electronic meters build into the Slot Controller Board. The electromechanical meter stays with the Slot cabinet whereas the Slot Controller Board may be replaced, at which time it must be remembered to record all meter readings just prior to replacement to ensure accounting continuity. This, then, is one advantage of the use of an electromechanical meter.

There have been random occurrences in which the electromechanical meter would not track the stored electronic data, virtually always reading fewer coins in than the electronic data. This has been found to result from the following causes:

1. Incorrect command pulse signal level to drive mechanical meter.
2. Inadequate command pulse duration to assure full incrementation.
3. Faulty electromechanical meter that fails to fully increment with each command pulse.

If disparities in the data are detected, the following steps should be taken to identify and correct the cause:

1. Check the Interface PC Board to ensure capacitor C11 and resistor R11 are deleted. If they are present, clip them out. These components form a snubber circuit for relay K11 to enable it to function properly under an inductive load (such as a coil). Since a 680 ohm resistor has been added to the wiring for the electromechanical meter, relay K11 is never subjected to an inductive load. With the 680 ohm resistor (located immediately before the 2 pin molex connector for the meter), the snubber circuit deteriorates the command signal level to a marginal point.
2. Verify the 680 ohm resistor is correct and not defective. Check the value with an appropriate meter with power off and electromechanical meter disconnected. Move the leads about to ensure no intermittent condition exists.
3. If a Slot Controller Simulator Test Board is available, install it and depress the coin-in switch while observing the meter. While holding the switch down, move and tug on the meter wires and connector. If the meter steps up, there is an intermittent wire or crimp pin in connector.
4. Check the coin-in switch on door for proper adjustment and proper spacer. The spacer must be correct denomination as this part determines the "on" time of the switch. The electromechanical meters require much greater "on" time to assure incrementation than the electronic accounting.
5. If all the above is found correct, the disparity in data is most likely a result of a defective electromechanical meter. Being mechanical, this unit has a finite life expectancy resulting from wear, defects, environmental conditions, etc. Replacement electromechanical meters are available from Summit Distributing. Order Part Number 10517.

AUTOBLOT INFORMATION BULLETIN

Bulletin No. 009

Issue Date: 5/26/83

Subject: Care and Feeding of Hoppers

Page: 1 of 5

Maintaining the accuracy and performance and assuring the reliability of the hopper assembly depends on a good understanding of the function of each part and their working relationships. The purpose of this bulletin is to describe these functions, provide alignment procedures, troubleshooting guides and maintenance tips. This bulletin should be considered as an addendum to the maintenance manual.

Hopper Bowl - Functions as the coin reservoir and constantly funnels the coins towards the hopper disc for pick-up. It is attached to the main casting by 3 spring mounts which enable the bowl to "breathe" or momentarily expand away from the casting to self-clear coin jams. After reassembly, always check to ensure bushing is not locked on the bowl which will prevent breathing and result in frequent coin jams in the bowl area. This can be checked by holding the casting and pushing the bowl away. To check the lower mount, hold the base plate and push up on bowl. There is an extension spring connected between the casting pivot pin right side and top right side of the bowl. It completes the breathing feature and assures that the weight of the coins does not hold bowl away from the casting. If this spring is missing, coins can wedge between the bowl and casting resulting in severe jamming. There is an eccentric bushing on the right side of the bowl which must be adjusted to center the bowl about the lower half of the disc to prevent rubbing and eliminate gaps sufficient to allow coins to wedge in. Slowly rotate the bushing with 7/16" wrench while observing the gap. When most uniform spacing point is found, tighten the lock screw while holding the bushing in position. Rotate disc completely to ensure no contact is made at any point.

Inlet Slide - Guides the coin from the door diverter armature into the bowl. Adjust this part with empty hopper installed in machine. With door opened slightly, view into machine from right side, level with inlet slide, a flashlight may be helpful. Ensure slide clears below the diverter by 1/16"-1/8". Bend slide as required to obtain even spacing. If the slope of the slide is nearly level, loosen the 2 mounting screws and push slide downward. The diverter assembly on the door may also be adjusted upward to allow greater slope on inlet slide. Achieve maximum slope towards bowl to prevent stacking of coins on slide. The vertical guide on left side of slide must be checked to ensure clearance of diverter. Contact with diverter will result in its non-operation and misrouting of coins. This will create disparity in accounting data and may cause frequent coin-in jams (codes -1- and -2-).

Mixer - Stirs coins to orient them for pick-up by disc. The total coin weight of a full hopper could result in complete immobilization of the coins which would prevent pick-up. By catching and pushing the coins whenever the hopper is running, the mixer continually changes the orientation and shifts the load on the disc. There is no adjustments for the mixer but it should be noted that one of the three mounting screws is longer (1-1/8") and must be installed in the hole adjacent of the disc drive bushing with the motor drive pin in between. This arrangement serves as a brake for the disc to prevent free travel which could result in coins stopping under the coin switch actuator arm thus producing -8- codes.

AUTOBLOT INFORMATION BULLETIN

Bulletin No. 009

Issue Date: _____

Subject: _____

Page: 2 of 5

Coin Sizer Disc - Produces a channel about the outer perimeter of the hopper disc to single out coins for pick-up. It must be perfectly round and centered on the disc to allow the hopper knife to ride evenly on top as it rotates. It is attached by the same 3 screws that mount the mixer. Proper centering of the sizer disc is accomplished by means of a fourth screw passing through the exact center of the mixer and sizer disc and threaded into the hole in the exact center of the hopper disc. Ensure this screw is in place and is proper length. If screw is too long it will force against the motor drive shaft and push the disc forward overloading and possibly damaging the bearings.

Hopper Disc - Works in conjunction with all previously described parts to pick-up singled out coins, properly oriented around its perimeter, and drive them by means of raised pins over the knife to exit one at a time. The disc is supported and retained in position by 3 "V" grooved bearings that ride the mating ridge machined around the outer edge. This assures uniform rotation and restricts in-and-out play. Care must be used in handling the disc to prevent damage to the outer ridge. Disc must be flat to within .010". Check while laying flat on back surface on a surface plate. Inspect outer ridge for nicks prior to installation. If a nick is found, carefully file away the bulged area that would impair its passage through the bearing "V" groove. Disc is useable provided a minimum of 50% of ridge surface remains. Do not use if less than 50% remains at any point as disc may jump the groove at this point and seize up and possibly damage the bearings. Bearing load adjustment and in-and-out adjustment is detailed in coin switch actuator arm section below.

Coin Switch Actuator Arm - Serves several functions including activating the coin-out switch, retaining top disc bearing, guiding exiting coins flat against disc and casting, restricting "loose" coins from exiting and providing adjustment for accurate setting of coin-out switch. Straddling over the top of the casting and top bearing, the arm pivots on the shaft passing through the bearing and casting thus retaining the bearing. At the switch end of the arm is the adjusting screw and locknut for establishing the correct "on" time duration. At the opposite end is a tapered roller which rides up and down over the driven coins. This taper, along with the opposite angle on the knife holds coins flat against disc and casting to prevent jamming in exit chute. An extension spring is attached to the back portion of the arm to assure positive return to rest position between coins and resist loose coin motion. Arm must pivot freely but must also restrict in-and-out motion of disc. The shaft is retained in position by the allen set screw, in the top of the casting, mating to a reduced diameter section in the center of the shaft. This set screw is the disc bearing load adjustment.

The following adjustments are vital to the proper operating and reliability of the hopper and must be performed in the sequence noted due to interactions:

1. Temporarily install top bearing, arm and shaft. Slide arm rearward on shaft. Verify gap between casting and arm at both sides of shaft is between .005 and .020 inches. Note measurement.
2. Place the disc in position on lower 2 bearings. Assure properly seated in grooves.

AUTOBLOT INFORMATION BULLETIN

Bulletin No. 009

Issue Date: _____

Subject: _____

Page: 3 of 5

3. Place top bearing in position on disc and install arm and shaft.
4. Slowly tighten allen set screw while holding shaft centered through arm and apply light downward pressure on bearing to retain position until bearing is just held on disc ridge. This can be verified by continuously lifting front of shaft slightly while adjusting.

Note: Set screw is self-locking type and bearing load can not be detected by tightness of screw. Bearings may be damaged by overtightening set screw.
5. Rotate the outer race of one of the lower bearings with your finger while slowly tightening set screw. When bearing race can barely be turned, correct load adjustment has been achieved. Do not tighten any further.
6. Raise arm at roller and allow it to fall free. Verify no binding exists. Repeat several times.
7. Assure disc is slightly in front of casting at all points that coin crosses casting during exiting. This can be checked by sliding a nickel from disc over to casting above knife while pressing flat against disc and pushing against center of disc to remove in-and-out play. Verify that no portion of disc is lower than casting by rotating disc one position and checking again. Repeat process for one complete revolution.
8. If coin catches on casting at any point, install a .010" shim between bearing and casting. Repeat steps 1 through 7.
9. If step 7 fails again remove .010" shim and install .020" shim and repeat steps 1 through 7.
10. Apply power to empty hopper and listen for smooth operation. Some reduction gear noise may be heard but no grinding or scraping sounds should be present. Hopper disc rotation should be smooth and consistent, no jitter or hesitation should be observed. Turn off hopper.
11. Adjust coin-out switch by placing correct denomination coin on knife, flat against disc and rotate disc counter-clockwise to point where coin is contacting roller at approximately 10:30 on clockface for nickel and dime coins or 11:00 for quarter and larger.
12. Back out switch set screw sufficiently to assure switch is "off". Hold arm steady against coin and slowly tighten switch set screw to point where switch just "clicks" on. If working in noisy environment, use continuity meter to identify. Lock screw with lock nut while preventing screw from turning.
13. Slowly rotate disc clockwise just to point where switch clicks "off". Observe that roller is contacting coin at no earlier than 9:30 for nickel and dime or 10:00 for quarter or larger.

AUTOBLOT INFORMATION BULLETIN

Bulletin No. 009

Issue Date: _____

Subject: _____

Page: 4 of 5

14. If switch does not turn off by prescribed point, replace switch and repeat steps 11 through 13.

Note: Coin-out switch must be rechecked any time knife or actuator arm has been replaced, adjusted or involved in a coin jam.

Hopper Knife - Functions to remove loose coins running parallel to the driven coins by means of a tapered leading edge with the tip blunt enough to accept only the driven coin. It also functions to remove the driven coin from the disc by slicing it from the sizer disc and redirecting it to the exit chute. It has a tab directly in line with roller on the actuator arm that functions to keep the coin flat against disc and casting. This tab also provides the last level running surface for the coin as it passes under the roller to increase switch "on" time. The dimensions, shapes and angles of the knife are critical for proper performance. Do not alter this part. The only adjustments to be made are to assure the tip of the knife is down against sizer disc and knife runs flat against disc to prevent any coins from wedging in. The tab angle should be opposite and equal to the roller angle to assure even top and bottom pressure on coin as it exits. Tab should be adjusted vertically to assure minimum clearance of raised pins on disc.

Coin Stripper - Works in conjunction with the knife to smoothly strip the coin from the disc and provides wear surface for exiting coins. Assure the leading edge is snug against casting to prevent coins from catching. If this edge is not tight against casting or uneven, remove the stripper and rebend slightly to achieve. Do not overbend as this will result in a radical change in direction for the coin and may result in jams.

Coin Deflector - Functions to flick off multiple coins which could otherwise be carried onto the knife and possibly result in double-coining (2 coins exiting as one). This part is made of spring steel to allow the loose coin to slide under the arm. The arm contacts the coin at one point and as this contact point approaches the edge of the coin, the spring pressure snaps it away from the disc towards the center of the bowl. The correct adjustments for this part are obtained by first setting the arm vertically such that the top of the arm is level with the top of the coin when coin is on sizer disc and directly behind the arm. Use duck bill pliers to twist metal between the mounting screws and arm a little at a time to achieve. The correct in-and-out setting is accomplished by loosening the 2 mounting screws and moving the arm in to the point that arm just contacts coin, but does not apply any pressure to coin. Lock the inboard screw first, then outboard screw.

Hopper Motor - The motor/gear box is a one piece assembly that directly drives the disc by means of a drive pin, press fitted to shaft, driving against the drive bushing on the disc. The motor has an automatic brake assembly that is engaged whenever power is removed. There are no adjustments required on the motor assembly but brake assembly should be periodically inspected for wear and proper function. If brake is defective, hopper disc may coast long enough after shut-off to drive one additional coin under the roller assembly or completely out of hopper.

AUTOBLOT INFORMATION BULLETIN

Bulletin No. 009

Issue Date: _____

Subject: _____

Page: 5 of 5

General Maintenance - If a coin jam occurs, visually examine for deformed part(s) that may have caused or resulted in the jam. Merely clearing the jam will probably only result in additional jamming and further damage to the hopper. Replace all defective parts as soon as possible. Always check to see that disc is properly seated in bearings and bearing load adjustment is still correct.

Do not apply grease or oil to any components of hopper other than a light coat of grease on leaf of coin-out switch at adjusting screw contact point and an occasional drop of oil at the two points of contact between the actuator arm and shaft to avoid squeaking. The hopper is designed to run without application of lubricants. Lubricant collects coin dust, lint, and metallic particles which can impair proper operation. All bearings, gear box and motor bushings are sealed--do not attempt to repair or re-lubricate these items.

PROBLEM ALTERNATE BRLL.

PROBLEM CODE	ALTERNATE CODE	DESCRIPTION
20 PPP	C PPP	COIN-IN SWITCH
30 PPP	0 PPP	QUERPAY
31 PPP	C PPP	HOPPER JAM
32 PPP	C PPP	HOPPER EMPTY
33 PPP	C PPP	RESET DURING PAY
4X PPP	C PPP	BK1 REW-REEL X
50 PPP	C PPP	DOOR OPEN
6C PPP	6C PPP	METERS READ
70		FREE HANDLE
71-72-73		REEL NO. INDEX

C=COINS-IN P=COINS PAID
FLASHING LIGHTS WILL INDICATE A PROBLEM
FOR ALL CODES, EXCEPT 20, 50, AND 6C CODES.

1GT 5-SLOT
TILT CODES

12	LOW BATTERY VOLT.
21	COIN-IN TILT
31	EXTRA COIN PAID OUT
32	COIN-OUT JAM
33	EMPTY HOPPER
4X	REEL "X" TILT
49	REEL HECH, DISCONNECTED
61	BRD CHGS RAM
62	BRD EPROH

OPEN AND CLOSE DOOR TO CLEAR TILT. EXCEPT
CODES 12, 61 AND 62. (REQUIRES MAINTENANCE)

BALLY 5000
TILT DISPLAYED IN MESSAGE CENTER

COIN IN JAM	IMPROPER REEL SPIN
COIN REVERSE	REEL X MOVEMENT
COIN ERROR	OPEN DOOR SPIN
COIN OUT JAM	CHECK BATTERY
HOPPER EMPTY	CHECK HOPPER
DOOR PAY	RESET BY PRESSING
RESET DURING PAYOUT	RESET BUTTON

UNIVERSAL WIRE COLOR CODE

1-BLACK	(BK)	13-PINK	(PK)
2-BROWN	(BR)	14-BROWN/BLACK	(BR/BK)
3-RED	(CR)	15-RED/BLACK	(CR/BK)
4-ORANGE	(OR)	16-ORANGE/BLACK	(OR/BK)
5-YELLOW	(Y)	17-YELLOW/BLACK	(Y/BK)
6-GREEN	(GR)	18-GREEN/BLACK	(GR/BK)
7-BLUE	(BL)	19-BLUE/BLACK	(BL/BK)
8-VIOLET	(V)	20-GRAY/BLACK	(G/GR)
9-GRAY	(GY)	21-WHITE/BLACK	(W/BK)
10-WHITE	(W)	22-SLV BLUE/BLACK	(SL/BK)
11-SLV BLUE	(SL)	23-GRASS/BLACK	(GS/BK)
12-GRASS	(GS)	24-PINK/BLACK	(PK/BK)

SUBMIT ELECTRONIC SLOT MACHINE
TILT CODES

HOPPER RESET	COIN-IN STRUNG	HOPPER RESET
-1-	COIN-IN JAM	
-2-	NO FEEL SPIN	
-3-	REEL BRN/SPIN	
-4-	IMPROPER INDEX	
-5-	REEL SPIN AFTER INDEX	
-6-	COIN-OUT JAM	
-7-	COIN-OUT JAM, SELF CLEAR	
-8-		
-9-		

TILT LIGHT BLINKING AND COIN-OUT METER FLASHING
INDICATES INCOMPLETE PAY. IF THERE ARE COINS
IN THE HOPPER, USE THE HOPPER RESET TO CONTINUE
PAY. IF THE HOPPER IS EMPTY USE THE HOPPER FILL
PROCEDURE.

1GT FORTUNE ONE
SELF TEST

DEPRESS J/P RESET	LEN'S	CODE
START DISP.	D11, D12	3
COIN-IN	U13	4
	D11, D13	5
	D11, D12, D13	6
	D14	7
	D14	8
	D11, D14	9
	D12, D14	10
	U11, D12, D14	11
	U13, D14	12
	D11, D13, D14	13
	D12, D13, D14	14
	D11, D12, D13, D14	15

BALLY WIRE COLOR CODE

1-RED	6-BROWN
2-BLUE	7-ORANGE
3-YELLOW	8-BLACK
4-GREEN	9-GRAY
5-WHITE	0-NY TRACE
57-1 = WHITE WIRE WITH ORANGE TRACE	
57-1 = WHITE WIRE WITH ORANGE TRACE, 1ST OCCURENCE.	

INTERNATIONAL COLOR CODE (RESISTOR/CAPACITOR)

0 BROWN	5 GREEN
1 BROWN	6 BLUE
2 RED	7 VIOLET
3 ORANGE	8 GRAY
4 YELLOW	9 WHITE

THIRD BAND IS THE MULTIPLIER. IF BLACK, THE
MULTIPLIER IS 0.
FOURTH BAND IS THE TOLERANCE. NO BAND, 20%
SILVER, 10% GOLD, 5%.

100 VOLTAGE SLOT MACHINE
ERROR CODES

11	LOW VOLT TILT
12	BATTERY POLARITY
13	PAYMENT INTERRUPTED
21	COIN-IN JAM
31	COINS OUT-DISBURSED
32	HOPPER JAM
33	HOPPER EMPTY
41	1ST REEL, IMPROPER SPIN
42	2ND REEL, IMPROPER SPIN
43	3RD REEL, IMPROPER SPIN
51	DOOR OPEN
52	DOOR OPEN DURING REEL SPIN

(CHECK REEL AND PUSH RESET BUTTON.)


TOT STEPPER SLOT
TILT CODES

21	COIN-IN JAM
31	OVERPAY
32	HOPPER JAM
33	EMPTY HOPPER
34	ILLICIT HOPPER PAY
35	HARD PAY JACKPOT
4X	REEL TILT
49	DOOR OPEN
50	DOOR OPEN
61	BAD RAM
62	BAD EPROH

RESULT: OPEN AND CLOSE DOOR

C E 1 HOT SLOT

E12	BATTERY LOW
E13	GAME PGM CHECKSUM ERROR
E31/32	OVERPAY/HOPPER FAILURE
E63	DATA ROM CHECKSUM ERROR
ES0/51	DOOR OPENED
E52	DOOR DOOR OPENED
E53	HOPPER EMPTY
E59	FRONT GLASS NOT IN CONNECTOR
E63	NO SCHEDULE ERROR
E49	REEL CONTROLLER NOT RESPOND.
E4X, E7X	MISC. REEL PROBLEMS
E61	INTERNAL MEMORY ERROR
E20	SHUNT COIN-IN ERROR
E30	SHUNT COIN-OUT ERROR
E21	STUCK COIN-IN ERROR
E32	STUCK COIN-OUT ERROR



Thank you!
COINSLOTS.COM