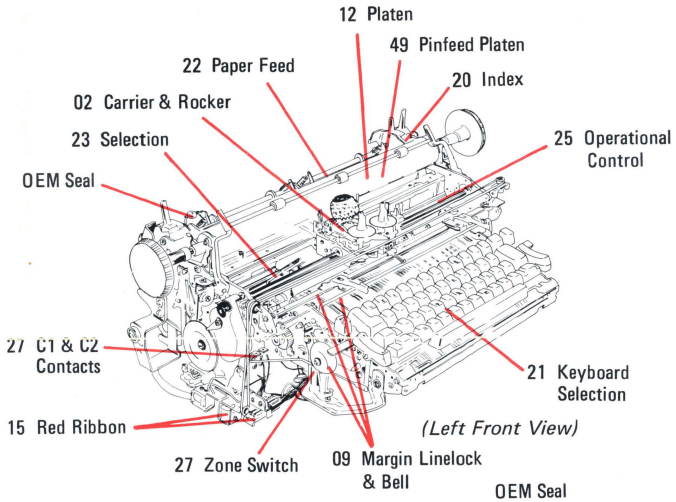
IBM

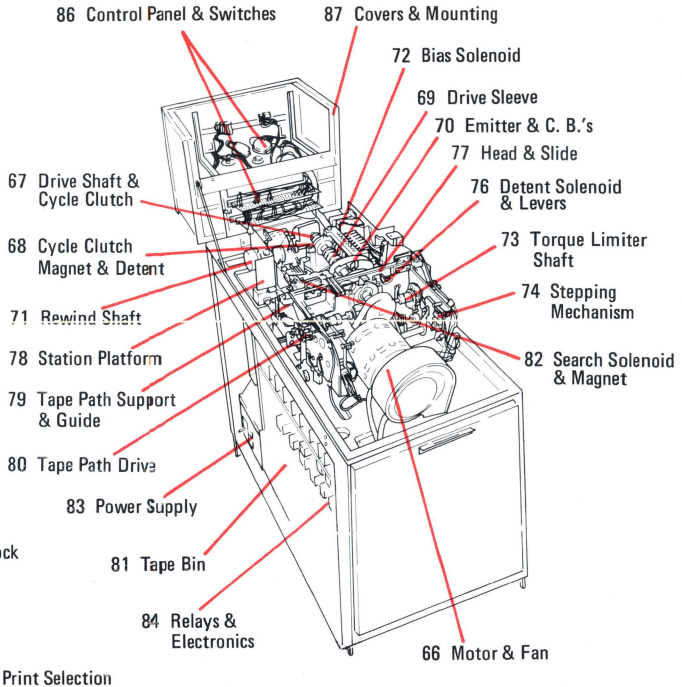
MT/ST I/O

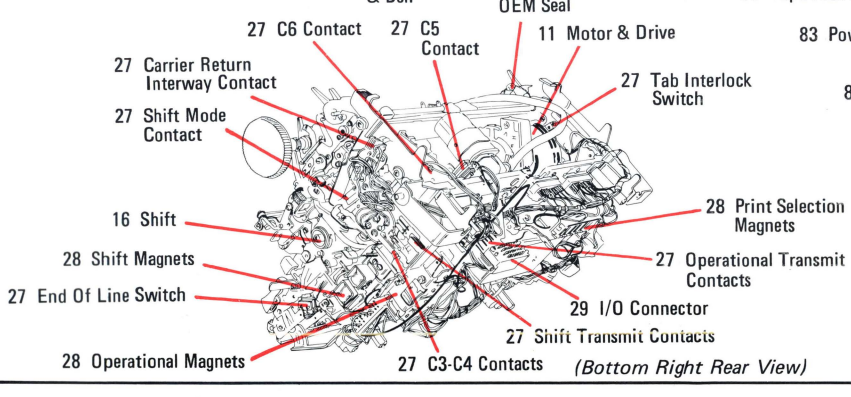
Adjustment Parts Manual

Magnetic Tape "Selectric" Typewriter

"Selectric" Input/Output Typewriter







MT/ST
CONTENTS
(Alphabetical)

"SELECTRIC" I/O TYPEWRITER
CONTENTS
(Alphabetical)

INTRODUCTION

This manual is written for both US and World Trade usage. It contains sections for adjustments, diagnostics and parts manual.

Product Name	Product Code
Magnetic Tape "Selectric" Typewriter	23
"Selectric" I/O Typewriter	22

For model numbers, see the inside rear cover.

ADJUSTMENT SECTION

Purpose
This section provides experienced service personnel a reference for the most commonly used adjustments. Refer to other Product Service publications if additional information is needed.

Adjustment Identification
The headline of each page shows the product name, product code and the name of the mechanism covered on that page. Each adjustment is indicated by a black frame number on the top left corner, followed by the adjustment name and mechanism code/reference number. The machine mode, the view of the drawing and safety precautions are also noted when required.

Adjustment Sequence
The frame numbers indicate the sequence of adjustments. One adjustment could affect a following adjustment. Therefore, check all the following adjustments in that mechanism. A vertical red line indicates the end of the mechanism.
Red numbers on the bottom left corner of the frame indicate adjustments out of sequence that could be affected and should be checked.

Adjustment Procedure
The part to be adjusted is colored red and a red arrow shows the direction of movement. Tolerances and/or additional information on how to perform the adjustment are shown when required.
Always use the adjustment tolerance shown in the publication with the latest date.

Call Reporting (US Only)
Mech. code, fail. code and part ref. are not required on MT/ST calls. All other applicable entries are required.

DIAGNOSTICS SECTION

Function Checks – Provide a reliable procedure to test the different mechanisms for failure.

Flow Charts – Provide a block logic procedure of finding problem areas.

Diagnostic Tapes – Contain prerecorded information designed to test functions and help diagnose machine and/or formatting problems.

PARTS MANUAL SECTION

Introduction
This section contains parts drawings of mechanisms, reference numbers and other special information. It must be used with a separate part number/price list which contains reference numbers, part numbers, part descriptions and prices.

Mechanism Identification
The headline of each page shows the product name and product code covered on that page. The headline of each frame shows the mechanism name and the mechanism code covered in that frame. Numerical part references separated by a dash (e.g., 22-174) refer to another mechanism for ordering information. The mechanism numbers precede the dash. Some mechanisms require more than one frame. However, each mechanism consists of a group of parts that work together to perform a function.

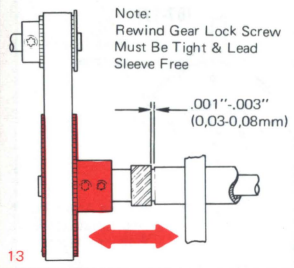
Parts Identification
Red numbers indicate the reference number of a part, a bill of material (B/M) or an assembly.
Red blocks within a frame indicate either one, or a combination of more than one, of the following:

- Differences between features.
- Different levels within the same model (level 1, level 2, etc.).
- Field replacement parts.
- Bill of material (B/M) or assemblies (shown with a description – parts shown in the drawing).
- World Trade application or differences.

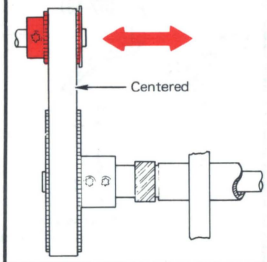
If different levels exist, which can be used for all models, only the newest level is shown in the drawing. However, the part number/price list will show all level parts.
Some parts are shown for assembly purposes only and do not show a reference number. Replace these parts by ordering either the assembly or a later level part.

Parts Ordering
Locate the mechanism in which the part functions by using the contents page. Note the mechanism code, find the part in the drawing and note the reference number. Use the mechanism code/reference number to locate the part number and price in the part number/price list.
World Trade should use the country's procedures to find the prices.
Features and devices (MESs) or specification changes (SERs) wished by the customer, must be ordered through CE management and branch office sales.
Replacement parts for features, devices and SERs, not shown in the parts manual, must also be ordered through CE management and branch office sales.

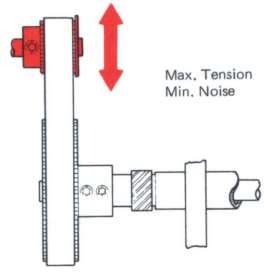
1 Drive Shaft End Play (67-10)



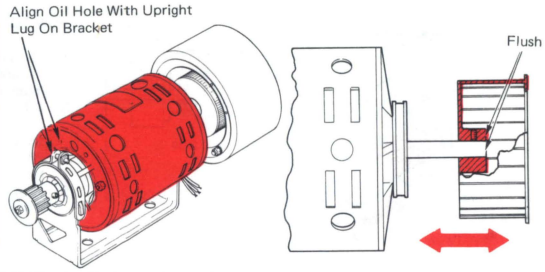
2 Belt Tracking (66-10)



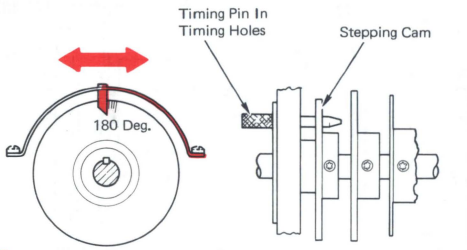
3 Belt Tension (66-57)



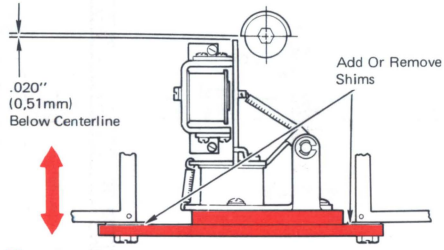
4 Motor And Fan (66-40) (66-11)



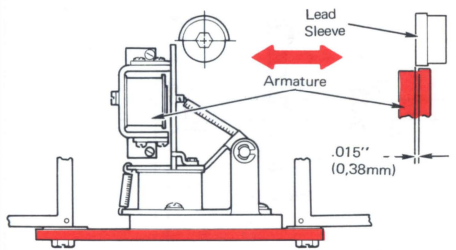
5 Pointer Bracket (69-26)



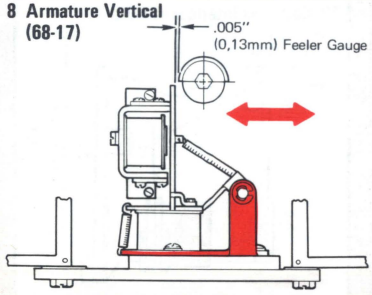
6 Cycle Clutch Armature Height (68-19)



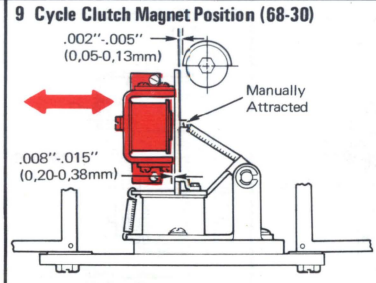
7 Armature Front-To-Rear (68-19)



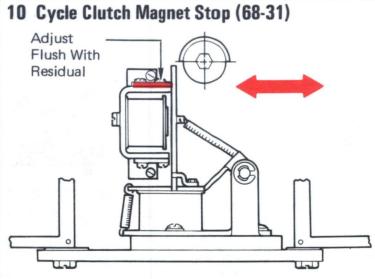
8 Armature Vertical (68-17)



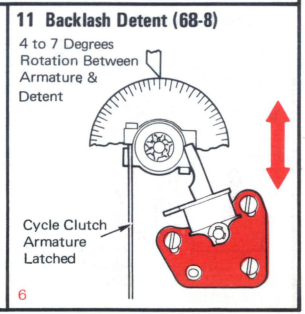
9 Cycle Clutch Magnet Position (68-30)



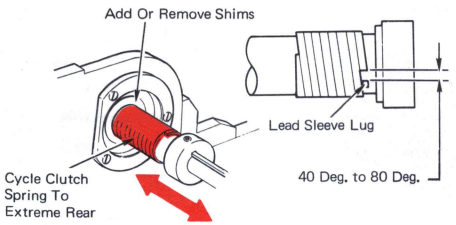
10 Cycle Clutch Magnet Stop (68-31)



11 Backlash Detent (68-8)



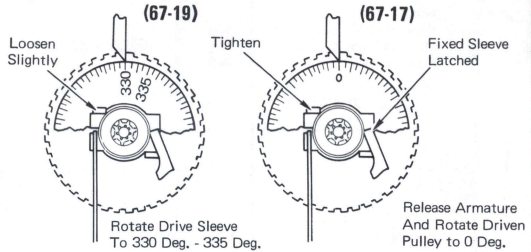
12 Lead Sleeve (67-18)



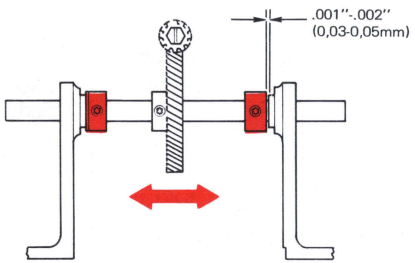
HOW TO MEASURE LEAD

1. Manually pick the armature.
2. Advance the lead sleeve fully c.c.w. to its maximum lead position.
3. Advance the entire drive sleeve assembly by turning the driven pulley c.c.w. until the lead sleeve just touches the armature.
4. With the lead sleeve just touching the armature, read the degree wheel.
5. Now rotate the driven pulley c.c.w. until slip occurs.
6. Read the degree wheel again. The difference in readings is lead.

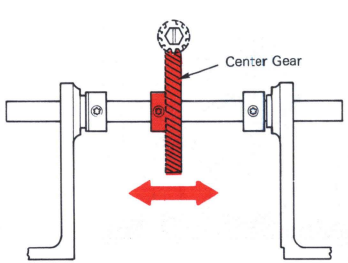
13 Cycle Clutch Spring Slip Point



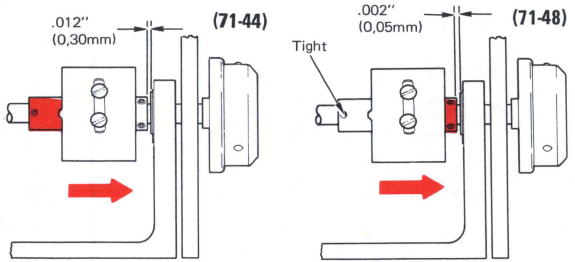
14 Rewind Shaft Position (71-19)



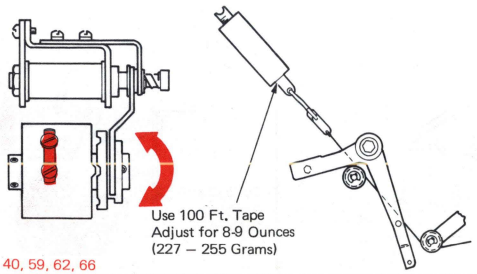
15 Helical Gear Position (71-21)



16 Bias Clutch Arbor Clearance



17 Low Bias (71-45)



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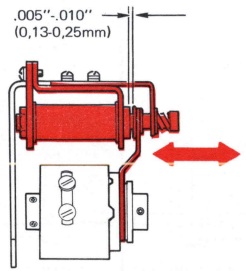
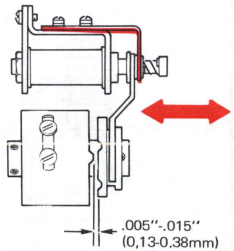
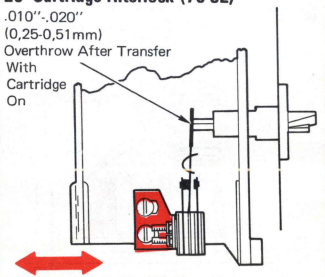
18 Bias Solenoid Position (72-11)



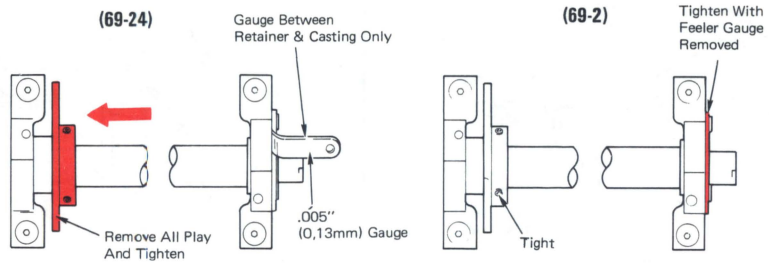
19 Bias Solenoid Backstop (72-1)



20 Cartridge Interlock (78-32)



21 Drive Sleeve Pre-Load



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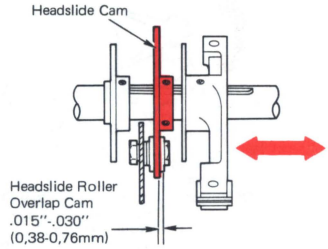
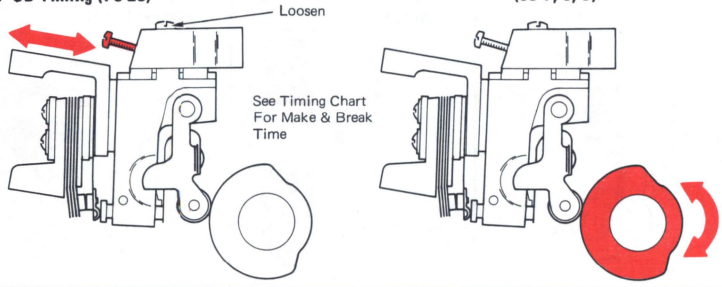
22 Headslide Cam (69-23)



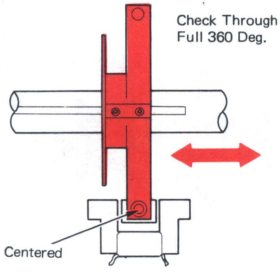
23 CB Timing (70-25)



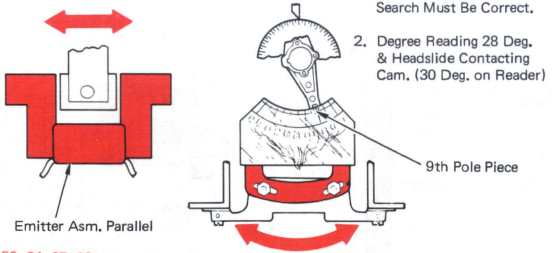
MT/ST CONTACT TIMING

Contact	Make	Break	Name
CB 1	135	340	Char. Stored
CB 2	165	025	Relay Timing
CB 3	300	160	Record Timing
CB 4	025	245	Thy. Control
CB 5	235	025	Cycle Clutch
CB 6	220	330	Backstroke
CB 7	240	350	Stepping
CB 8	038	144	Forestroke

24 Emitter Arm (69-20)

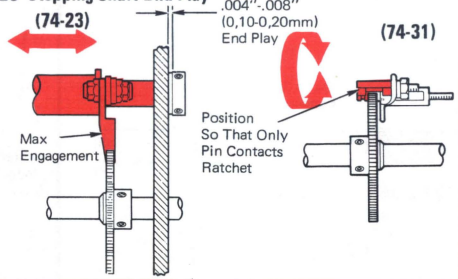


25 Emitter Basket (70-1)

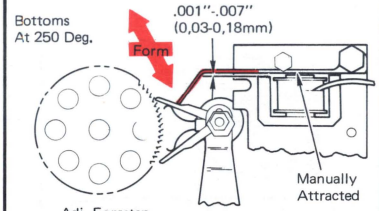


59, 64, 67, 68

26 Stepping Shaft End Play



27 Stepping Magnet Armature (74-19)



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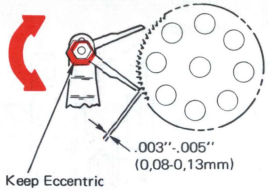
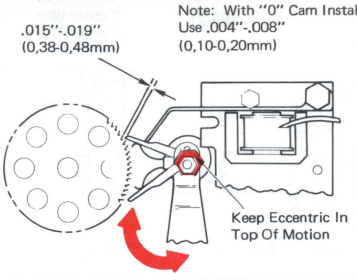
28 Forestepping Finger Eccentric (74-12)

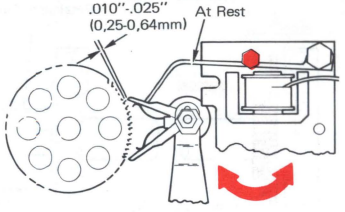


Adjust With Degree Wheel
At 250 Deg. ± 50 Deg.
Note: "0" Cam Installed
Use .004"-.008" (0,10-0,20mm)

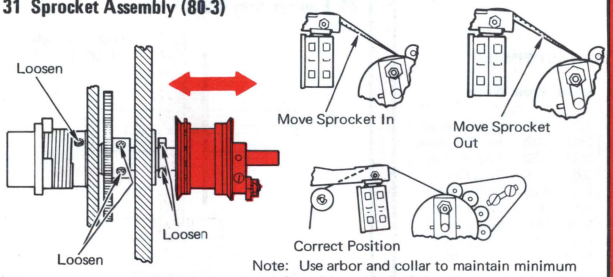
29 Backstepping Finger Eccentric (74-12)



30 Stepping Magnet Armature Eccentric (74-21)



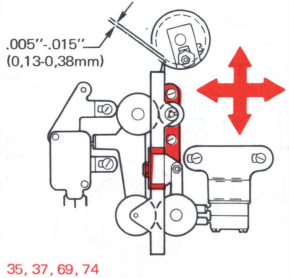
31 Sprocket Assembly (80-3)



Note: Use arbor and collar to maintain minimum endplay with no binds. Set ratchet against bearing.

46, 62, 64, 66, 67, 68

32 Tape Chute (80-25)



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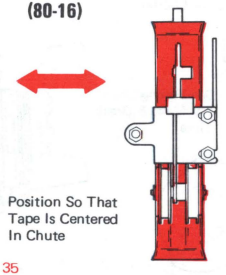
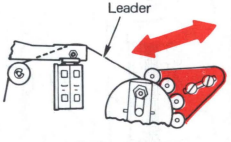
33 Tape Chute Left-To-Right (80-16)



Position So That
Tape Is Centered
In Chute

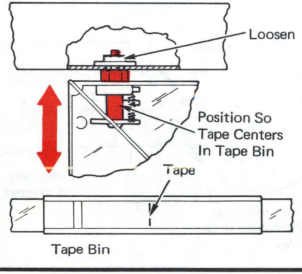
35

34 Tape Guide Roller Bracket (80-1)

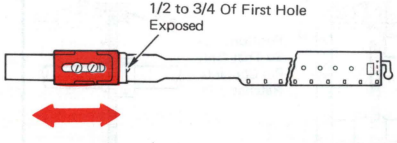


Rollers Flush
Against
Leader

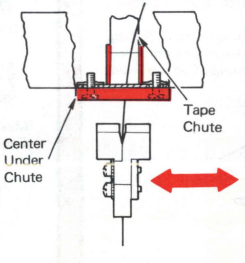
35 Tape Bin Locating Stud (81-18)



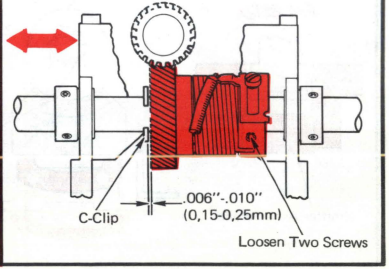
36 Leader Stop (81-13)



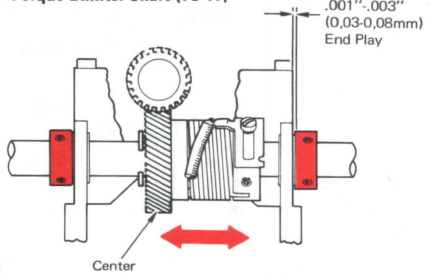
37 Nylon Stop (87-86)



38 Torque Limiter Arbor (73-24)



39 Torque Limiter Shaft (73-17)



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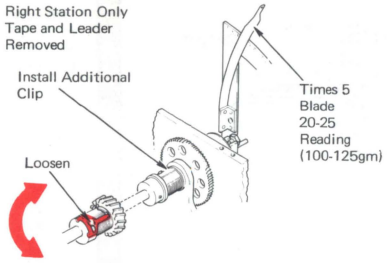
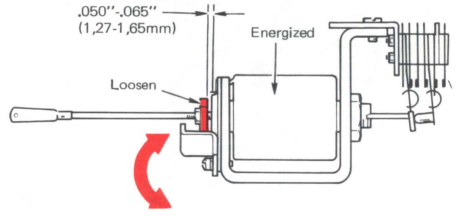
40 Torque Limiter Output (73-25)



41 Detent Solenoid Plunger (76-12)



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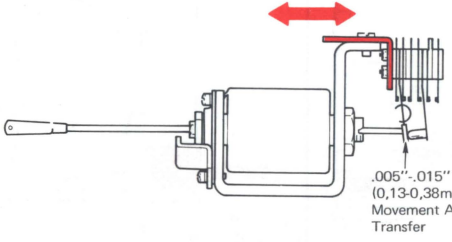
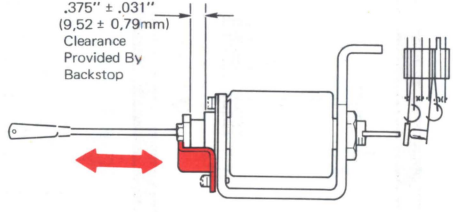
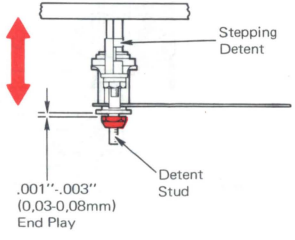
42 Detent Out Contacts (76-26)



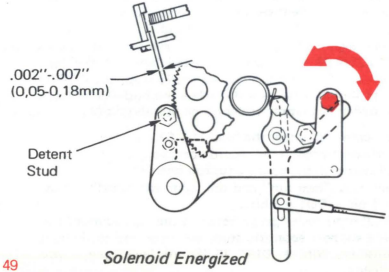
43 Detent Solenoid Backstop (76-1)



44 Detent Lever (74-3)



45 Detent Actuating Lever (74-1)



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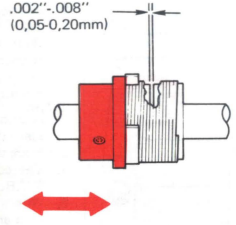
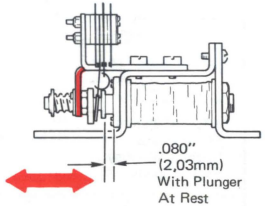
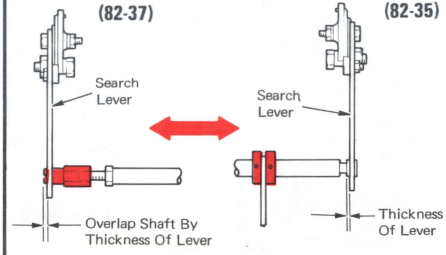
46 Search Arbors (73-16)



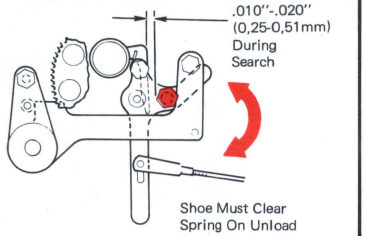
47 Search Solenoid Backstop (82-40)



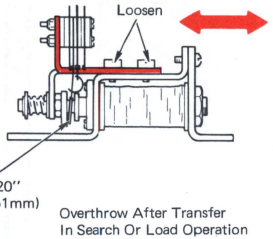
48 Load Search Shaft



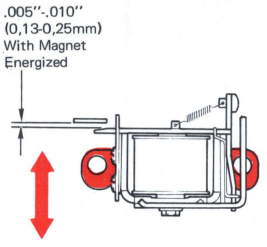
49 Search Shoe Clearance (76-22)



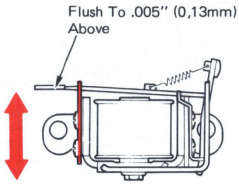
50 Load Search Contacts (82-41)



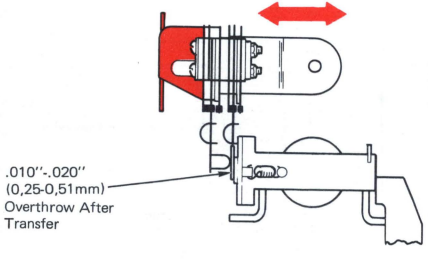
51 Search Position Magnet (82-13)



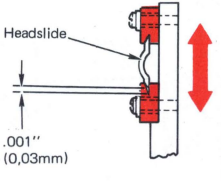
52 Search Position Magnet Upstop (82-3)



53 Search Position Magnet Contacts (82-18)

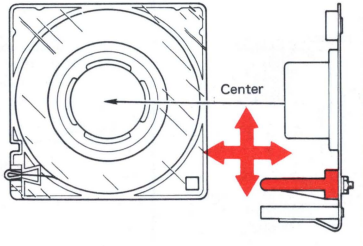


54 Headslide Bearings (77-2)

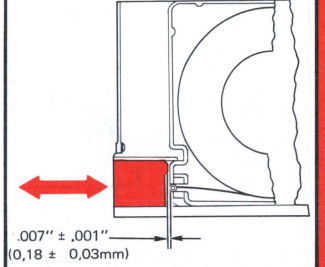


52, 59

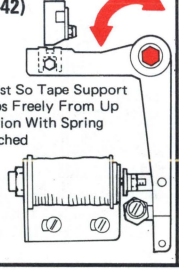
55 Cartridge Locator Pin (78-25)



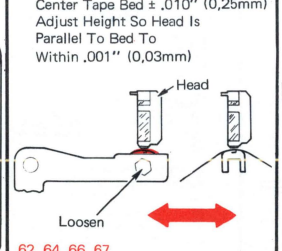
56 Station Block (78-12)



57 Tape Support Pivot (79-42)

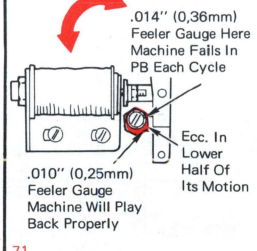


58 Tape Bed (79-2)

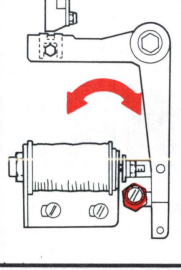


62, 64, 66, 67

59 Head To Tape (79-43)



71



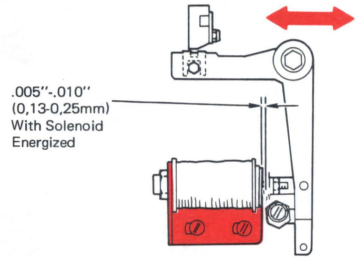
MT READER (Left and Right Stations)

1. Install the "input from tape reader/output to lights" program steps described in the head alignment section for the MT Reader.
2. Position an uppercase "N" (1-5-8) under the head.
3. Turn on the head alignment switch in the MT Reader (continuous run).
4. With a .010" (0,25mm) feeler gauge inserted between the tape support arm stop and the tape support eccentric stop, the 4-16-64 bit position lights should glow steadily. (New method—keybuttons 8-6-4.) With a .014" (0,36mm) feeler gauge you should have no lights.

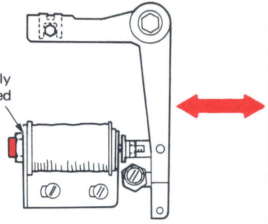
T.T.R.

1. Position an uppercase "N" under the head (1-5-8).
2. Place the EOT release switch in the record position.
3. Place the CE aid switch in the continuous run position.
4. The console will now "free run" and the lights will steadily glow. T.T.R. (ready = 1 bit — EOT = 8 bit).
5. With a .010" (0,25mm) feeler gauge between the tape support arm stop and the tape support eccentric stop, the error and ready light should glow steadily. With a .014" (0,36mm) feeler gauge you should have no lights.

60 Tape Support Solenoid (79-9)

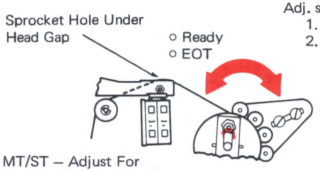


61 Tape Support Solenoid Core (79-55)



Plunger Attracted — Adjust Core Until It Contacts Plunger — Backoff 1/2 Turn

62 Sprocket Adjustment (80-5) (Along The Tape)



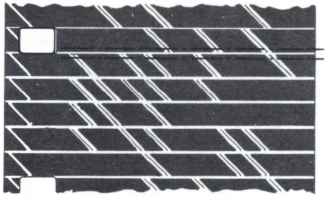
For TTR
Section "A" of Master Tape
Adj. sprocket for:
1. Both lights
2. No lights (With good tape and TTR at sprocket hole)

MT/ST — Adjust For Continuous 1 & 8 Bit Or No Bits With Good Tape

● Error
○ On
● Ready

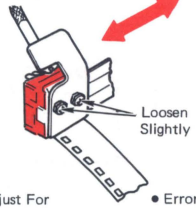
MT/SR
Section "A" of Master Tape
Adj. sprocket for error light and ready light

63 Along The Tape (Comparator)



Note: After developing a magnetic tape. Remove the developer before winding the tape back into the cartridge. Failure to do so can cause machine problems.

64 Head Alignment (77-10) (Across The Tape)



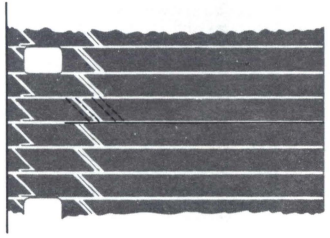
TTR
Section "B" of Master Tape
Adj. head for no lights except "c" light next to CE Aid Switch

MT/SR
Section "B" of Master Tape
Adj. head for error light and ready light

MT/ST — Adjust For Continuous 1 Bit

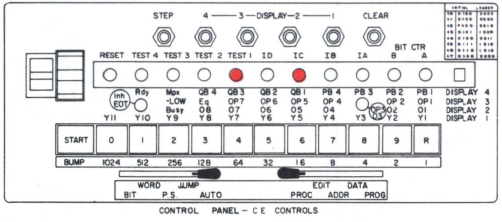
● Error
○ On
● Ready

65 Across The Tape (Comparator)



66 Head Alignment "Along" (80-5)

TTR — Head Alignment check 7 bit in reference code with comparator



Section "A" Of Master Tape

Adj. Sprocket Eccentric For Continuous 16 & 64 Bit

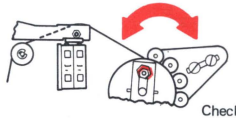
BYTE	KEY
0	7
1	67R
2	37
3	69R
4	0
5	0

Note: Address Byte 0 To Process

Third Tape Recorder — Along "Ready" And E.O.T. Light "On" "C" Light "Off".

NOTE: Continuous No Bit (With Good Tapes & Reading At Sprocket Hole) Is Acceptable

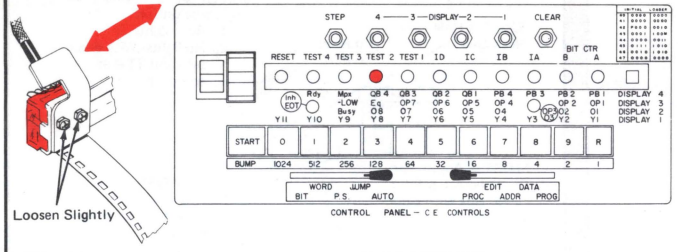
To Align Left Station Change Byte 1 Data To 678R



Check Alignment With Sprocket Turn To This Position Against Bias

"C" Light Is Next To CE Aid Switch

67 Head Alignment "Across" (77-10)



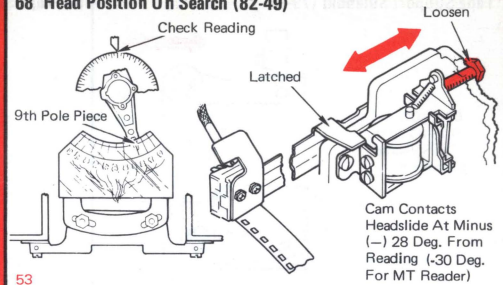
Section "B" Of Master Tape

Adj. Head For Continuous 128 Bit

Note: Machine tolerances may be such that the 128, 4 and 1 bit position lights occur simultaneously. If all three lights are "ON", the alignment is acceptable.

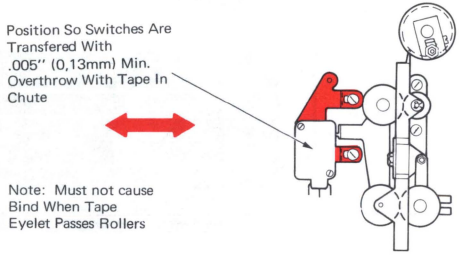
Third Tape Recorder – Along "Ready" And EOT Light "On" "C" Light "Off"

68 Head Position On Search (82-49)



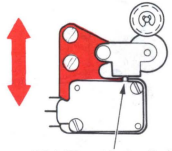
53

69 Rewind Switch Position (80-10)

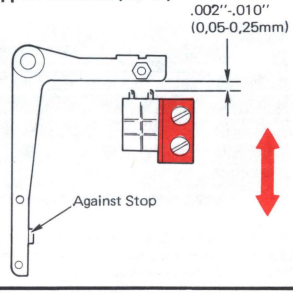


32

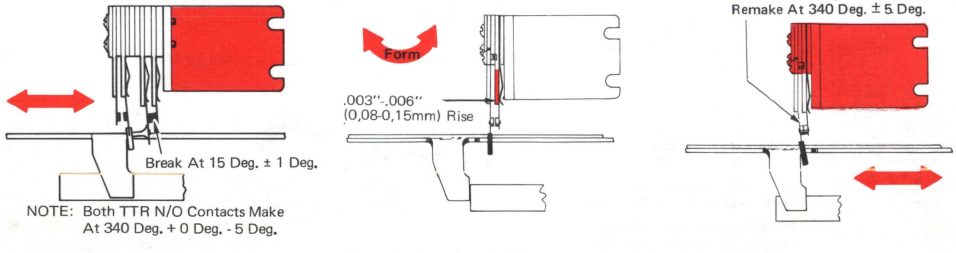
70 End Of Tape (79-29)



71 Tape Support Switches (79-47)



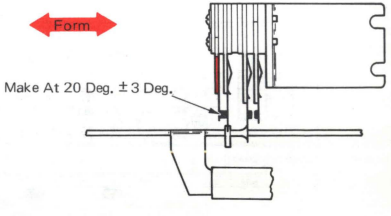
72 Home Position Contact (77-33) (77-34) (77-33)



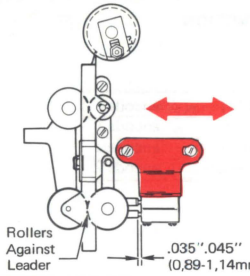
NOTE: Both TTR N/O Contacts Make At 340 Deg. + 0 Deg. - 5 Deg.

(MT/ST Machine At Rest) *(MT/ST Reader)*

73 Home Position Contact (77-34)

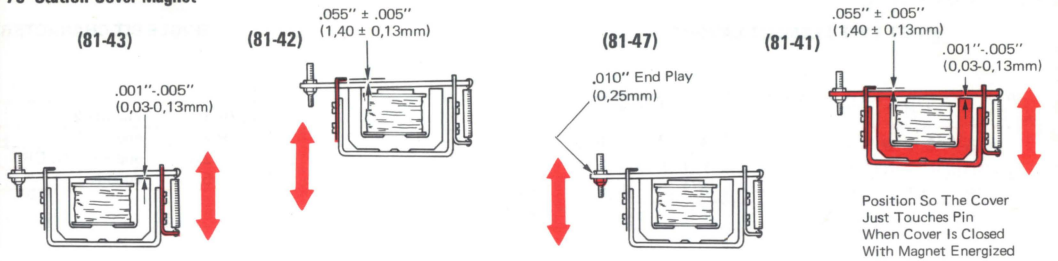


74 Leader Sense Switches (80-31)

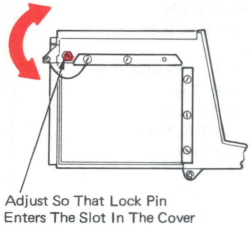


32

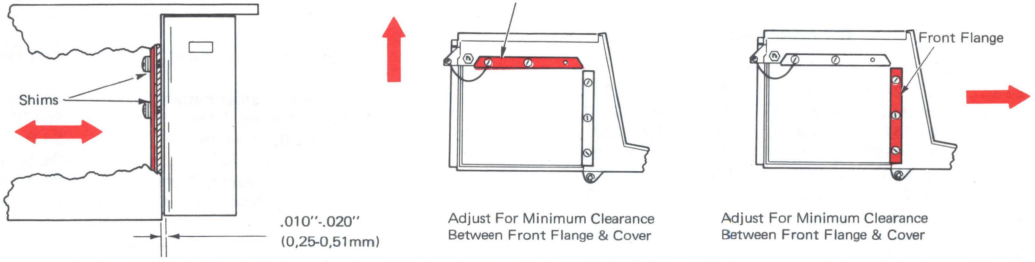
75 Station Cover Magnet



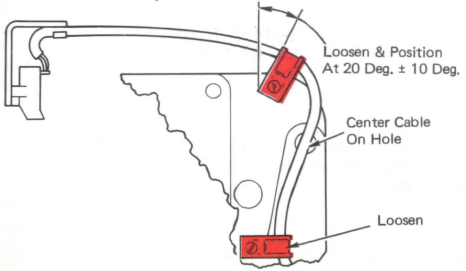
76 Tape Station Cover Adjusting Nut (81-3)



77 Tape Station Cover



78 Head Cable Clamps (77-15)



MT/ST TYPE ELEMENT LAYOUT

−5	−4	−3	−2	−1	H	+1	+2	+3	+4	+5	−5	−4	−3	−2	−1	H	+1	+2	+3	+4	+5	
[	#	&	*	$	Z	@	%	c	)	(	]	3	7	8	4	z	2	5	6	0	9	T-0
X	U	D	C	L	T	N	E	K	H	B	x	u	d	c	l	t	n	e	k	h	b	T-1
M	V	R	A	O	°	.	"	I	S	W	m	v	r	a	o	!	.	'	i	s	w	T-2
G	F	:	,	?	J	+	P	Q	Y	—	g	f	;	,	/	j	=	p	q	y	-	T-1,2

SINGLE BIT CHARACTER OR FUNCTION

1 bit (R-1)	-	encode 2	5 bit (T1)	-	encode t
2 bit (R-2)	-	encode 5	6 bit (T2)	-	encode !
3 bit (R-2A)	-	encode Rev. CR	7 bit (Ck)	-	encode z
4 bit (R-5)	-	encode]	8 bit (Shift)	-	encode Z

BIT CODE CHART

2 - 1	c - 12457	n - 157	y - 23567	Shift - 8
3 - 147	d - 245	o - 23467	z - 7	Rev CR - 3
4 - 234	e - 257	p - 256	; - 24567	Tab - 367
5 - 2	f - 14567	q - 12567	, - 12456	Space - 356
6 - 127	g - 456	r - 246	. - 167	Stop - 134
7 - 247	h - 235	s - 236	' - 267	Feed - 135
8 - 124	i - 126	t - 5	! - 6	Bksp. - 346
9 - 123	j - 567	u - 145	/ - 23456	Auto Search - 136
0 - 237	k - 125	v - 146	= - 156	Stop Trans. - 13456
a - 12467	l - 23457	w - 12367	- - 12356	Switch - 137
b - 12357	m - 467	x - 457	[- 4	Prog. Search - 13467
				Red Ribbon - 34567
				Adj. - 13567

NOTE: For upper case characters, add an 8 bit in every case and add or delete a 7 bit for odd bit parity, i.e., a is 12467, g is 456, A is 12468, G is 45678.

ADJUST CHART

CODES READ IN TAPE	TYPEWRITER ACTION	
	OUT OF REGION	IN REGION
1. Successive Carrier Returns	Sp, Repetitive CR	CR, Repetitive CR
2. Carrier Return, Tab(s)	Sp, CR, Tab	CR, Tab
3. Single CR, Character	Sp, Print	CR, Print
4. Sp. CR, Character	Sp, Sp, Print	Sp, CR, Print
5. Character, Hyphen, Character	Print, Hyphen, Print	Hyphen, CR, Print
6. Character, Hyphen, CR, Character	Print, Hyphen, Print	Print, Hyphen, CR, Print
7. Character Tab		*Print Tab
8. Sp, Bksp, Hyphen, CR, Character	Sp, Bksp, Print	Sp, Bksp, Hyphen, CR, Print

NOTE: *If tabulation ends beyond region, machine stops.

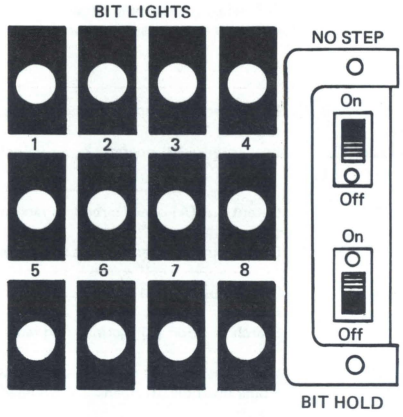
NOTE: Machines with relay 213 will print successive hyphens in or out of the region. Machines with relay 203 will print one hyphen only out of the region.

CE AIDS

A. No step switch – opens the ground circuit for the stepping magnets, thereby inhibiting incremental tape drive.

B. Bit hold switch – provides a hold for the character stored relay 76 (through its pick circuit) if playback error occurs.

C. CE bit lights – indicate thyratron fires, thereby indicating the bit in the bit relay register.



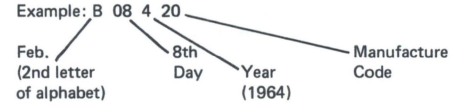
+12 volt fuse – if this fuse blows – .4 volts will be present on the head read coil. This could cause erasure of the search codes or of a single character.

-12 volt fuse – this fuse blown will cause all bit thyratrons to fire every time the console is cycled.

Bit hold switch – if the bit hold switch is in the ON position, the machine will not read reference codes on old level machines below 83153.

MT/ST TAPES

The tapes have been coded as follows:



Tape life is affected primarily by the following:

1. Torque limiter adjustment.
2. Bias adjustment.
3. Binds, tape guides, rollers, etc.
4. Handling techniques.
5. Customer usage.

TAPE STORAGE

Tapes may be stored in the following environment:

Temperature Range	Maximum Humiditiy
40 Deg. – 90 Deg. F	20 – 80%

NAME	LOCATION	IDENTIFICATION	PURPOSE
Reel interlock contact	Under bias clutch	N/A	Prevents detents from being removed when no tape cartridge is present
End of tape switch	To the rear and below tape station block	EOT (R) A 2 brown wires on O/P EOT (R) B 2 white wires on O/P EOT (L) A 1 wire on O/P, N/C, N/O EOT (L) B 1 wire on O/P, N/O	Interlock console when end of tape is reached. Picks record error and opens circuits to detent.
Tape support (pressure pad) switch	Between tape support and tape support solenoid.	P/P A 2 brown wires on N/C P/P (R) B 1 brown wire on N/C P/P (L) A 1 brown wire on O/P P/P (L) B 2 brown wires on O/P	P/P (A) opens stepping circuit P/P (B) indicates tape support is up.
Leader sense switch	On outside of power frame just to the front of the tape chute.	LEADER SENSE (R) A 2 white wires on O/P LEADER SENSE (R) B 2 brown wires on O/P LEADER SENSE (L) A 1 brown wires on O/P LEADER SENSE (L) B 2 brown wires on O/P	Leader sense (A) opens circuit to tape support solenoid. Leader sense (B) operates cover unlock.
Detent out contact	Just in front of each detent solenoid	DETENT OUT (L&R) black wire on A N/C	Detent out (A) opens circuit to tape support solenoid. Detent out (B) opens circuit to transmit contacts.
Search position	Just in front and right of the search position magnet	SEARCH POSITION A is on the inside	Search position (A) operates detent solenoid in search. Search position (B) grounds ring relays in search.
Home position contact	Just to the rear of the head slide	HOME POSITION A 2 wires on the O/P HOME POSITION B 1 wire on the O/P	Home position (A) operates search position solenoid. Home position (B) opens C/C till head restores in search.
Load search solenoid contacts	Just to the right of the left detent mounting stud.	N/A	Completes circuit to detent solenoid during load and forward search.
Circuit breakers (CB)	To the upper left of the drive sleeve.	Numbered front to rear 1 thru 8	Provide gating for relays and electronics
Rewind sense switch	On outside of power frame to the rear of tape chute,	N/A	Picks and holds relays 121 and 107 while the roller is in the rewind slot.

RELAYS AND ELECTRONICS (MECH. 84)

48-VOLT LOOP DIAGNOSTICS

A procedure that may be used to diagnose the cause of a blown 48-volt fuse is to systematically break the 48-volt loop to determine the circuit that is shorted.

There may be a slight variation from this loop on older machines. This should be used as a guide and is not an exact wiring breakout on all machines.

STEP 1
Disconnect the I/O plug in the I/O. (This will isolate the I/O from the circuit.)

STEP 2
Disconnect the cable wire in 234-11 O/P. (This will eliminate the double input to the loop. In some cases you can hook an ohmmeter to this lead and read the short to the ground; if so, you can look for the short in this manner and not blow fuses under power.)

Note: Turn the machine off and remove the fuse before taking a meter reading.

STEP 3
Disconnect the wire in RC 15-9C. (This will isolate the control panel mode switches from the circuit.)

STEP 4
Disconnect the cable wire in 63-1 O/P. (This will isolate the gate from the circuit.) The 48-volts are now applied only to the tape deck.

At this point if the fuse does not blow, the short is in the relay gate. If so, reinsert the wire into 63-1 O/P and follow the cable loop disconnecting cable wires until the short is isolated to a particular row. Then follow the row jumper list to isolate the short to a point or particular circuit input.

ROW 3

From	To
63-1 O/P	65-6 O/P
65-6 O/P	68-4 O/P
68-4 O/P	70-1 O/P
70-1 O/P	73-1 O/P
73-1 O/P	76-2 O/P
76-2 O/P	76-8 O/P
76-8 O/P	76-10 O/P
76-10 O/P	79-7 O/P
79-7 O/P	82-2 O/P
82-2 O/P	87-5 O/P
87-5 O/P	87-8 O/P
87-8 O/P	90-5 O/P
90-5 O/P	90-7 O/P

ROW 4

From	To
103-1 O/P	107-5 O/P
107-5 O/P	109-2 O/P
109-2 O/P	110-4 O/P
110-4 O/P	112-8 O/P
112-8 O/P	112-9 O/P
112-9 O/P	112-10 O/P
112-10 O/P	116-2 O/P

ROW 6

From	To
158-6 N/O	161-6 N/O
161-6 N/O	161-9 N/C
161-9 N/C	164-7 N/C
164-7 N/C	164-12 N/O
167-1 O/P	170-2 O/P
170-2 O/P	173-5 N/O
173-5 N/O	176-6 N/O
176-6 N/O	180-6 N/C
180-6 N/C	183-3 N/C
183-3 N/C	183-4 N/O

PANEL

From	To
SW-4-A O/P	SW-4-c O/P

TAPE DECK

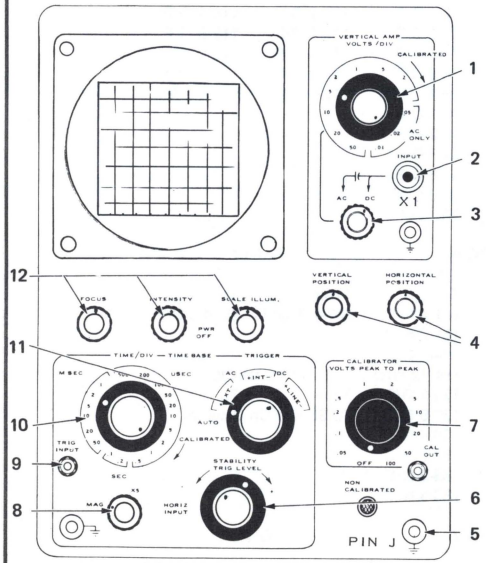
From	To
As Shown On Diagram	

ROW 7

From	To
201-1 O/P	214-1 O/P

ROW 8

From	To
234 -2 O/P	234-9 N/C
234-9 N/C	234-11 O/P



1. Volts Per Division Dial
   a. Set inside dial fully clockwise.
   b. Set outside dial at vertical volts deflection required.

2. Scope Probe Input
   Use a X1 probe.

3. Scope Input Dial
   Set at DC.

4. Vertical & Horizontal Position
   Set these dials to position the signal trace at the desired position on the screen.

5. Ground Connector
   Connect this to the pin J buss bar.

6. Stability Dial With All Dials And Connections Set (Sync.)
   a. Turn both dials fully clockwise.
   b. Start machine cycling.
   c. Turn inside dial counterclockwise till signal just disappears.
   d. Turn outside dial counterclockwise till signal just appears.

7. Calibrator
   Turn dial to off (for using this dial refer to scope operator manual).

8. Magnification Dial (Time)
   Set at X1.

9. Trigger Input Connection
   Inductively couple to trigger required.
   (Do not connect 48V directly to ext. trigger input.)

10. Time Per Division Dial
    a. Set inside dial fully clockwise.
    b. Set outside dial at required time sweep (an MT/ST cycle is 50 milliseconds).

11. Trigger Input Dial
    a. Set inside dial at DC.
    b. Set outside dial at + ext.

12. Focus — Intensity — Scale Illumination
    Set these three dials for the sharpest signal.

These are the most common settings; however, there may be cases where these settings must be changed. For example, the trigger input (9) may be set to — ext. or internal triggering.

When scoping the CBs, the things to look for are:

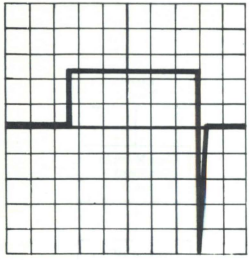
A. Bouncing CBs — This will show up as a break in the trace.

B. Excessive Negative Spikes — A spike exceeding 275 volts can cause a problem with the bit relays.

C. CB Time and Duration.

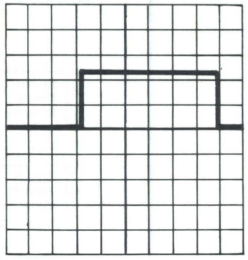
When scoping the electronics, the signal should appear as indicated by the signal number on that point. Most electronic signals can be seen by triggering on CB-8 and setting the time/div. dial at X5. The volts/div. dial should be set for the most readable signal. When reading the output from the read head, a lower sweep setting will be necessary.

WAVE SHAPES



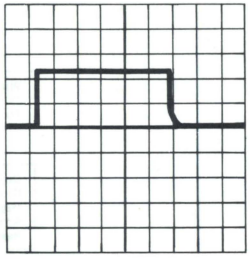
CB-1

Settings
1-20 volts/div.
9-CB-8
10-X5 milliseconds
SKIP MODE



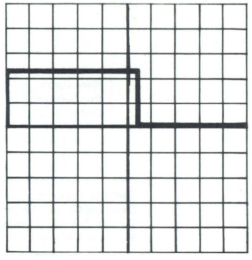
CB-2

Settings
2-20 volts/div.
9-CB-8
10-X5 milliseconds
SKIP MODE



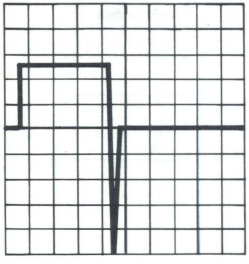
CB-3

Settings
1-20 volts/div.
9-CB-6
10-X5 milliseconds
SKIP MODE



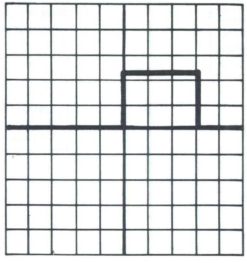
CB-4

Settings
1-20 volts/div.
9-CB-4
10-X5 milliseconds
SKIP MODE
O/P disconnected



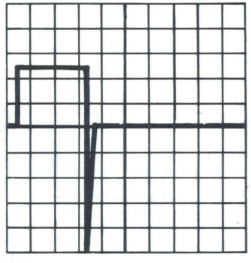
CB-5

Settings
1-20 volts/div.
9-CB-6
10-X5 milliseconds
SKIP MODE



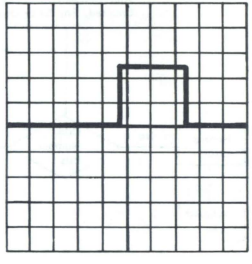
CB-6

Settings
1-20 volts/div.
9-CB-8
10-X5 milliseconds
SKIP MODE



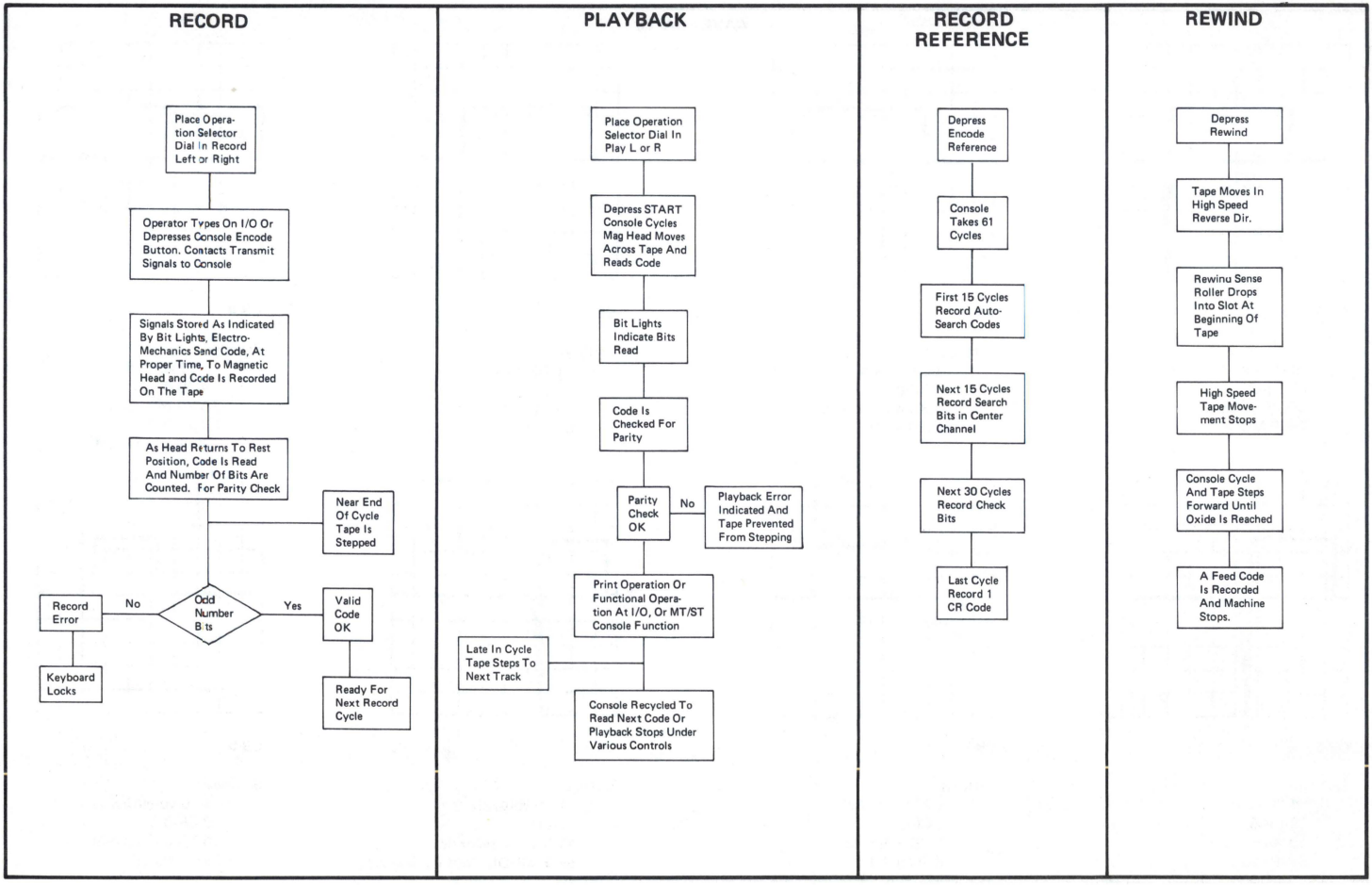
CB-7

Settings
1-20 volts/div.
9-CB-6
10-X5 milliseconds
SKIP MODE (not in no-step)

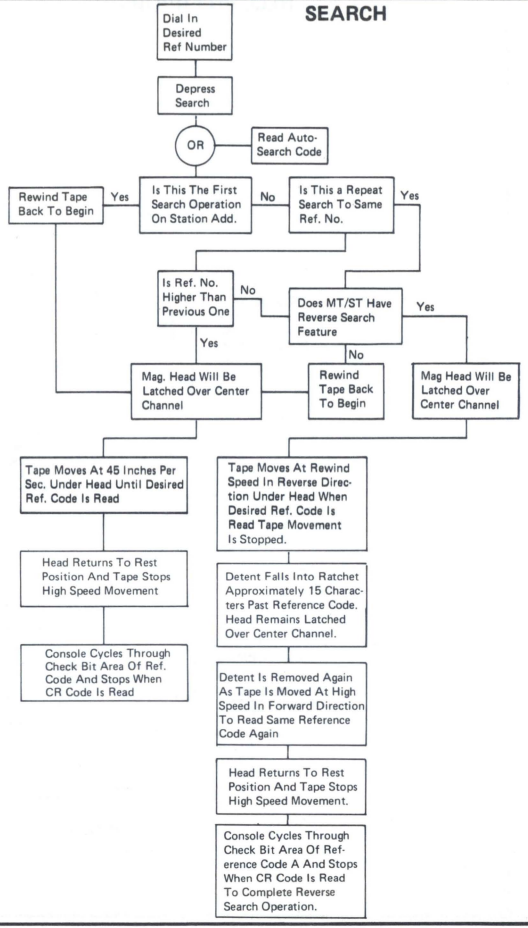


CB-8

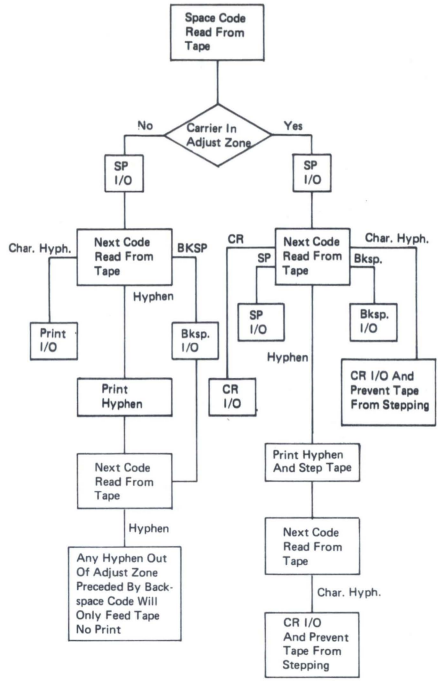
Settings
1-20 volts/div.
9-CB-6
10-X5 milliseconds
SKIP MODE


RECORD
Place Operation Selector Dial In Record Left or Right
Operator Types On I/O Or Depresses Console Encode Button. Contacts Transmit Signals to Console
Signals Stored As Indicated By Bit Lights, Electro-Mechanics Send Code, At Proper Time, To Magnetic Head and Code Is Recorded On The Tape
As Head Returns To Rest Position, Code Is Read And Number Of Bits Are Counted. For Parity Check
Near End Of Cycle Tape Is Stepped
Odd Number Bits
No
Yes
Record Error
Keyboard Locks
Valid Code OK
Ready For Next Record Cycle
PLAYBACK
Place Operation Selector Dial In Play L or R
Depress START Console Cycles Mag Head Moves Across Tape And Reads Code
Bit Lights Indicate Bits Read
Code Is Checked For Parity
Parity Check OK
No
Playback Error Indicated And Tape Prevented From Stepping
Print Operation Or Functional Operation At I/O, Or MT/ST Console Function
Late In Cycle Tape Steps To Next Track
Console Recycled To Read Next Code Or Playback Stops Under Various Controls
RECORD REFERENCE
Depress Encode Reference
Console Takes 61 Cycles
First 15 Cycles Record Auto-Search Codes
Next 15 Cycles Record Search Bits in Center Channel
Next 30 Cycles Record Check Bits
Last Cycle Record 1 CR Code
REWIND
Depress Rewind
Tape Moves In High Speed Reverse Dir.
Rewind Sense Roller Drops Into Slot At Beginning Of Tape
High Speed Tape Movement Stops
Console Cycle And Tape Steps Forward Until Oxide Is Reached
A Feed Code Is Recorded And Machine Stops.

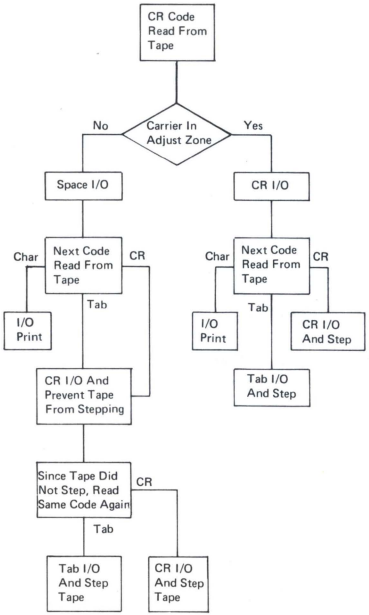
SEARCH



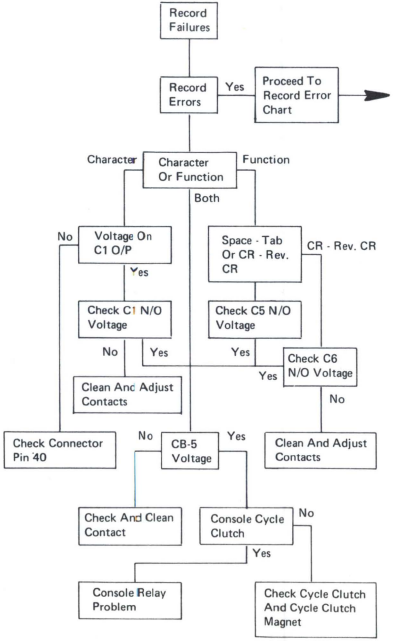
ADJUST



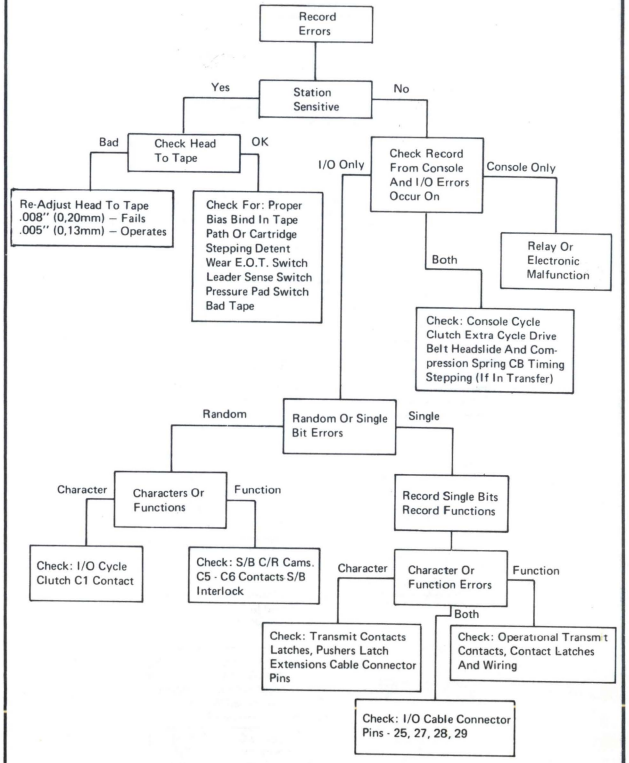
ADJUST



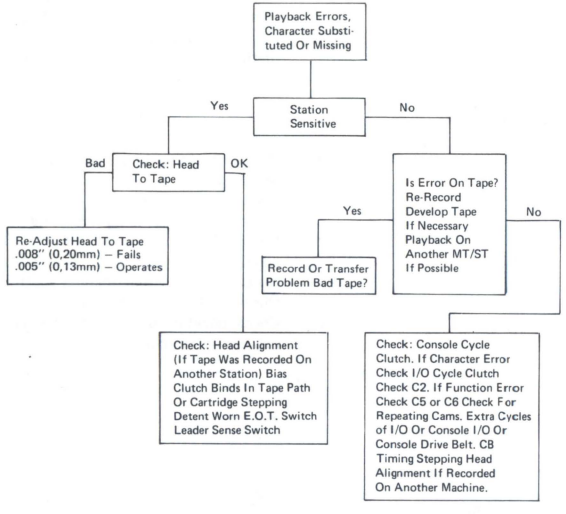
RECORD FAILURES



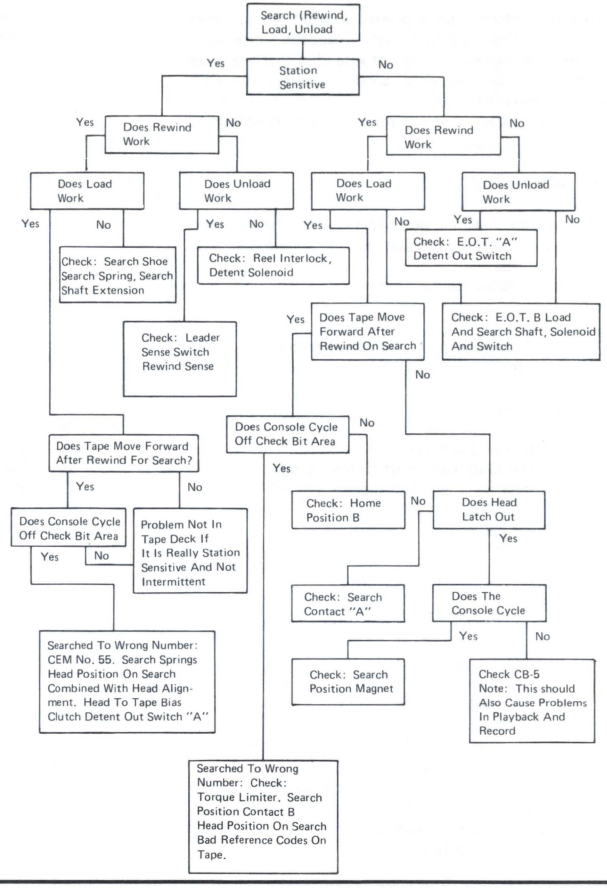
RECORD ERRORS



PLAYBACK ERRORS



SEARCH FAILURES



PREVENTIVE MAINTENANCE

The following information is printed to assist the customer engineer in developing a meaningful inspection procedure for a particular machine. It is not intended that the areas outlined below be the only areas to which the CE's attention be directed. Each machine installation will differ slightly in application and environment. This procedure is to be used only as a guide.

INSPECTION PROCEDURE

A. Discuss the machine performance with the operator. Repair any existing problems on the system.

B. Clean and lubricate the printer.

No. 10 Oil
1. All bearings, rollers and pivot points
2. Motor (once a year)

No. 23 Grease
1. All cam surfaces
2. All sliding surfaces
3. Cycle clutch and shift clutch springs
4. Upper and lower ball sockets and ball joints
5. All latching surfaces
6. Feed roll pivots

C. Clean and lubricate the tape deck

I. Every Cycle
   A. Console cycle clutch 23 grease

II. As Required
   No. 10 Oil
   A. Backlash detent pivot
   B. Cycle clutch armature pivot
   C. Circuit breaker roller pivot points (lightly)
   D. Search magnet armature pivot
   E. Detent pivots
   F. Search springs (light film)
   G. Motor bearings
   H. Drive sleeve rear bearing
   I. Head slide bearings
   J. Stepping pawl pivots
   K. Sprocket guide rollers
   L. Tape support pivot
   M. Rewind sensing arm pivot
   N. Buffer arm pivot
   O. Guide rollers
   Any Areas Where Rust Is Apparent

III. No. 23 Grease
   A. Bias clutch
   B. Rewind shaft gear
   C. Search magnet armature top surface (lightly)
   D. Head slide compression spring
   E. Circuit breaker cams (light film)
   F. Helical gear
   G. Stepping cam
   H. Head slide cam
   I. Torque limiter spring (through setscrew)

IV. Molykote®
   A. Bias clutch dog plate
   B. Bias lever fork
   C. Stepping ratchet

D. Perform the following checks:

1. **Motor and Drive**

   a. Check drive belt alignment.
   b. Remove belt, invert and check for cracks and missing teeth.
   c. Check belt tension.

2. **Drive Shaft and Cycle Clutch**

   a. Drive shaft end play .001"-.003" (0,03-0,08mm).
   b. Check to see if cycle clutch latches at zero degrees.
   c. If fretting or corrosion exist, completely rebuild the cycle clutch, replacing all parts.
   d. Check latching surface of lead sleeve and fixed sleeve.
   e. Check drive (clutch slips at 330 degrees to 335 degrees).
   f. Check lead for 40 degrees to 80 degrees.
   g. Remove and replace cycle clutch spring at least once a year, at which time the end of the drive sleeve, drive arbor, and wear insert should be examined.

3. **Cycle Clutch Magnet and Detent**

   a. Check condition of armature base rubber bonding.
   b. Check armature residuals.
   c. Make sure magnet is tight in yoke.
   d. Check for .002"-.005" (0,05-0,13mm) clearance between the armature and cycle clutch sleeves when manually attracted.
   e. Check backlash detent binding.
   f. Check backlash detent for 4 degrees to 7 degrees overthrow.

4. **CBs**

   a. Remove as an assembly, clean contacts, and lightly lubricate pivot points.
   b. Check CB timing.

5. **Bias Clutches**

   a. Check for 8 to 9 ounces of low bias.

6. **Torque Limiter**

   a. Check for a reading of 20 to 25 (100 grams to 125 grams) on the gauge with an X5 blade.

7. **Leaders**

   a. Check for wear at sprocket holes.
   b. Ensure leader interposes properly.

8. **Detents**

   a. Check detent solenoids for free motion.
   b. Check stepping detents for wear.

9. **Stepping Shaft**

   a. Hold the stepping cam follower arm. Push the stepping arms front-to-rear. No free motion should be felt.

10. **Head Slide Assembly**

    a. Check the cam follower roller for binds.
    b. Check for .001" (0,03mm) up and down motion in head slide bearings.
    c. Head slide must move freely with spring removed.
    d. Check head position on search.

11. **Tape Path**

    a. Check for sticking micro switch plungers.
    b. Check tape support bellcrank for binds.
    Note: Check condition of tape beds.
    c. Check tape chute for cracks and dirt.

12. **Head Cables**

    a. Check for loose connections at the SMS card block.
    b. Check for proper head cable adjustment.

13. **Station Cover Interlock**

    a. Ensure that the station cover cannot be opened without depressing the unload button.

14. **Replace air filter annually.**

15. **Place the test tape on the machine and run a complete checkout procedure.**

    a. Head alignment (both stations).
    b. Search and playback references one through twenty-one.
    c. Check all record functions (I/O and console).
    d. Check all playback functions (console).

16. **Clean all covers.**

I/O CYCLE A, B, C & D

I. Remove Type Element
   A. Look for a worn type element
   B. Check upper ball socket play (horizontal and vertical)
   C. Check tilt, ring side play
   D. Check carrier shoe clearance
   E. Check carrier side play

II. Half Cycle Neg. 5 No Tilt Character
   A. Check rotate spring tension
   B. Check tilt detent side play
   C. Check tilt homing — correct any drift

III. Replace Type Element
   A. Check rotate for binds (pull shift arm)
   B. Check skirt clearance
   C. Half Cycle WTORM — check detenting and rotate detent side play
   D. Half cycle WTOM (solid arm). Correct for any drift over .020" (0,51mm) in negative (pay) direction
   E. Check timing on M

IV. Backspace
   A. Check B/S rack free motion
   B. Check carrier motion

V. Unlock Keyboard With Machine Off — Depress Carrier Keylever
   A. Check filter shaft clearance
   B. Check interposer travel after latching (.015") (0,38mm)
   C. Check cycle clutch keeper clearance (.000"-.002") (0,00-0,05mm)
   D. Check cycle clutch latch pawl overthrow and clutch latch bite on sleeve
   E. Check cycle shaft end play (.002"-.006") (0,05-0,15mm)
   F. Check cycle clutch spring for slippage

VI. Trip The Return And Hand Cycle Slowly
   A. Cycle clutch trip from print magnet
   B. Shift interlock cable
   C. Operational magnets tripping

TEST PROCEDURE FOR PROGRAM SEARCH — Reference Code

1. With a tape on the left tape station, depress the switch code button on the I/O. A switch code will be recorded, and a "j" will print on the paper. NOTE: Console switch code button may be used, but will not print a "j." — p01j p02j p03j p04j p05j p06j p07j

2. Depress the P.S. code button on the I/O. A program search code (1, 3, 4, 6, 7) will be recorded, and a "p" will print on the paper. — p08j p09j p10j p20j

3. a. If the machine is not equipped with the red-ribbon option, depress the REF code button on the I/O. A reference will be recorded. — p30j p40j p50j p60j p70j

   b. If the machine is equipped with the red-ribbon option, depress the red-ribbon code button on the I/O. A red-ribbon code (3, 4, 5, 6, 7) will be recorded, and the ribbon should change to red. The ribbon should remain in red until a carrier return operation is performed. — p80j p90j p99j p49j p09j p01j

Stop Code

4. After the above operations have been tested, load a tape on the right station. Record 99 reference codes on the right tape. After each code, record its numeric representation, followed by a carrier return, eight spaces, and a switch code. For example, after reference code one, record a 1, a CR, eight spaces, and a switch code; after reference code two, record a 2, a CR, eight spaces, and a switch code; etc. Record only switch codes on the left tape.

5. Check for proper search operations of all reference codes, both forward and reverse, from 1 to 99. After each search, the machine will switch to the left tape, switch back to the right tape, and search to the new number dialed in the reference dial.

6. After this operation has been tested, rewind the left tape and record as shown on right ("p" denotes program search code, "j" denotes switch code).

NOTE: When recording a program tape, the carrier return button is automatically deactivated for one CR operation. This permits recording of the program in a columnar form.

7. Change the mode dial to "play left" and the start condition dial to "start." Dial in 01 in the reference dial, and depress the search button. The machine should function as follows:

   a. After searching to reference code number one on the left tape, the machine will read and store the program search code. It will then read and store a two-digit address in the program search tens' and units' registers. After reading the switch code, the machine will switch to the right station and search for the number stored in the program search register, ignoring the setting of the dial. The first search on the right station will be a rewind search. After this initial search, counter-to-tape orientation will be established on the right station, and all following search operations will be either forward or reverse.

   b. After search to 01 on the right tape, a 1 will be printed, carrier return will be performed, and a switch operation will occur.

   c. After switching to the left tape (program tape), the next program instructions will be performed (search on right tape to 02).

NOTE: Pull the wire in 573-2 N/C to allow single cycle operation.

   d. The machine should continue through the entire program and stop, addressing the left tape, when the stop code is read.

8. If the machine is **not** equipped with the library option, install the program tape on the right station, and the "number" tape on the left station. Repeat the above test.

TEST PROCEDURE FOR LIBRARY OPTION

1. Load the "number" tape on the right station and search to position 5. Record a program search code over the "5" that was recorded in step 4, above.

2. Repeat this operation at positions 10, 15, and 20.

3. At reference position 2 on the program tape, record the program on the left station as shown on the right.

4. With the start condition switch in the "start" position, dial "02" in the reference dial and search on the left tape. The machine should function as follows:

   a. The first four operations will function normally, and the machine will print out:

      1
      2
      4
      3

   b. When the machine is commanded under program control to search for 05 on the right tape, it will encounter a program search code. Reading a program search code on the right tape initiates a "new card" routine. The "library search right and left" relays will pick, along with the "switch cycle" relay. The machine will switch to the left tape and automatically search to the number in the "reference dial." This will return the tape to the beginning of the program. The program will be reread from the beginning. During the first program cycle, since the "library search right" relay is up, the search counter will be reset to 01 and the "first search right" relay will be repicked. This establishes counter-to-tape orientation on the right tape.

   c. The first program control read from the program tape will be "p01j." Since the counter has been reset to 01 and "first search right" has been picked, the machine has been forced into the same condition as if it were at the rewind position. When it is commanded to search for "01," it will merely search forward to the **next** reference code.

   d. The **complete** printout from this program will be as shown on the right.

5. On machines equipped with library option, the program tape must always be installed on the left station. This is because a program search code read from the right tape signals a "new card routine."

6. When recording a program tape, the 1 (one) must always be recorded from keyboard position zero, regardless of what character is typed by that particular element. Similarly, the 0 (zero) must always be recorded from position 35. This is because the machine is looking for a particular tilt and rotate combination in the bit relays, when storing a program address.

1
2 4
3 6
7 9
8 11
12 14
13 16
17 19
18 21
22 24
23 25
26

PARAGRAPH INDENT CHECKOUT

1. a. With the right and left-hand margins of the I/O set approximately as shown on the following pages, set tabs at 10 space intervals starting at the left margin and ending near the right margin.

   b. Depress indent button on the I/O to its latched down position.

2. a. Turn machine on and load tapes on both stations. Rotate mode switch to "adjust." The adjust light should come on. If not, depress reset adjust button. Then if light does not come on, check wiring. Depressing the reset adjust button should change the status of the light. The encode adjust button should have no effect.

   b. Repeat above procedure for "transfer adjust."

   c. In "transfer type" or "playback," the adjust light should be off and neither the reset or encode adjust buttons should affect the light.

   d. In "record," the encode and adjust button should change the light status. When the encode button is pushed, the MT console should record a "13567" code on tape. The reset button should be inoperative.

3. Record a tape with the following format on either station. Parenthesis will indicate tape codes.

(Carrier Return)
(Carrier Return)
1 (Enc. Adj.) 5 (Tabs) Now is the time for (CR)
5 (Tabs) all good men to come (CR)
(CR)
1 (Enc. Adj.)
1 (Tab) Now is the time for all good men to come to the aid of their (CR)
country. (Tab) (Space) Now is the time for all good men to come to the aid of their (CR)
country. (Tab) (Space) Now is the time for all good men to come to the aid of their (CR)
country. (Tab) (Space) Now is the time for all good men to come to the aid of their (CR)
(CR)
3 (Tabs)
3 (Tabs)
3 (Tabs) Now is the time for all good men to come (CR)
3 (Tabs) to the aid of their country. Now is the (CR)
(CR) time for all good men to come to the aid (CR)
1 (Enc. Adj.) 5 (Tabs) of their country. Now is the time for all (CR)
1 (Enc. Adj.) (Stop)

4. Play back the above tape in adjust, with the right margin set at pointer scale position no. 65. The hard copy should be similar to the following. Brackets will enclose descriptions of printer action.

(First enc adj. code will turn light off) (5 Tabs) Exactly as recorded:
Now is the time for (CR)
(5 Tabs) all good men to come (CR)
(CR)
(Second enc. adj. code turns light on)
(1 Tab) Now is the time for all good men (CR near scale number 65)
(1 Tab) to come to the aid of their country. (CR near scale no. 65)

NOTE: Tabs in first line are counted and until double carrier return or adjust on-off code is read, this tab level is maintained. (This 1 tab sequence will continue until a double carrier return is recognized.)
1 (Tab) Now is the time for all good men to (CR)
(CR)
(3 Tabs) Now is the time (CR near scale no. 65)
(3 Tabs) Now is the time (CR near scale no. 65)
(This 3 tab sequence will continue until
a double carrier return is recognized.)
(3 Tabs) Now (CR)
(CR)
(5 Tabs) Exactly as recorded:
(Enc. adj. code turns light off) (5 Tabs) Now is the time for (CR)
(Enc. adj. code turns light on) (Stop)

5. a. Repeat step 4 with different start conditions (character, word, line, etc.). Two lines in each start/stop mode.

   b. Unlatch indent button by depressing and releasing. The reset and adjust buttons should be inoperative in all modes. Playback the previously recorded tape. The MT/ST should tab only on recorded tabs and the adjust should not change. (Adjust light will be on in adjust mode.)

6. a. (Factory) Set margins at "0" and "80." Playback paragraph indent test tape in adjust mode with indent button depressed.

   b. (Field) Prepare a tape with sufficient information to check automatic indentation for 7 different tab levels.

CARD READER TEST PROCEDURE

A. READ TO PRINTER FROM CARD READER

1. Place test deck 1 in card reader.

   a. Cards must be placed in hopper face down with the 12 edge to the left. Place card weight on top of deck.

   b. Depress feed key on card reader.

   c. Depress reader-on key on card reader.

2. The machine should automatically start in a read to printer operation when the start key is depressed.

3. The following printout should occur:

   1234567890
   ABCDEFGHIJKLMNOPQRSTUVWXYZ
   abcdefghijklmnopqrstuvwxyz
   [@ # $ % ¢ & * ( )

4. Test the machine in character, word and line.

   a. In character mode, the depression of the start switch should result in the print out of a single character.

   b. In the word and line modes, each start switch depression should result in the print out of a single line.

5. Test the operation of the stop switch. The card reader should stop when the switch is depressed and restart when the start switch is depressed.

CHECK OUT PROCEDURE CARD READER WITH ADDITIONAL CHARACTER CODING

1. The printer should be set as follows:

Left Margin	0
Right Margin	95
Tab Stops	10, 20, 60

2. Prepare a test tape with the following information recorded.

   a. Reference code
   b. This line only is on magnetic tape.
   c. Carrier return
   d. Switch to card code
   e. Auto search code

3. Rewind the tape and place the machine in the playback mode. Search for the proper reference code.

4. Load test deck 4 in the card reader. Depress the feed key.

5. Depress the reader on key.

6. Depress the start key.

7. The machine should start and print the following:

```
1234567890/-/   abcdefghijklmnopqrstuvwxyz      This is on card.
x               x               x               x_____@&#$,,,...:;;½½½===''
This line only is on magnetic tape.
1234567890/0/   abcdefghijklmnopqrstuvwxyz      This is on card.
x               x               x               x _____ @&#$,,,...:;;½½½===''
This line only is on magnetic tape.
1234567890/-/   abcdefghijklmnopqrstuvwxyz      This is on card.
x               x               x               x _____ @&#$,,,...:;;½½½===''
This line only is on magnetic tape.
1234567890/-/   abcdefghijklmnopqrstuvwxyz      This is on card.
x               x               x               x _____ @&#$,,,...:;;½½½===''
This line only is on magnetic tape.
1234567890/-/   abcdefghijklmnopqrstuvwxyz      This is on card.
x               x               x               x _____ @&#$,,,...:;;½½½===''
This line only is on magnetic tape.
```

a. Observe the machine for the following:

   (1) Ejection of the "1" cards should take place following the print-out of "card."

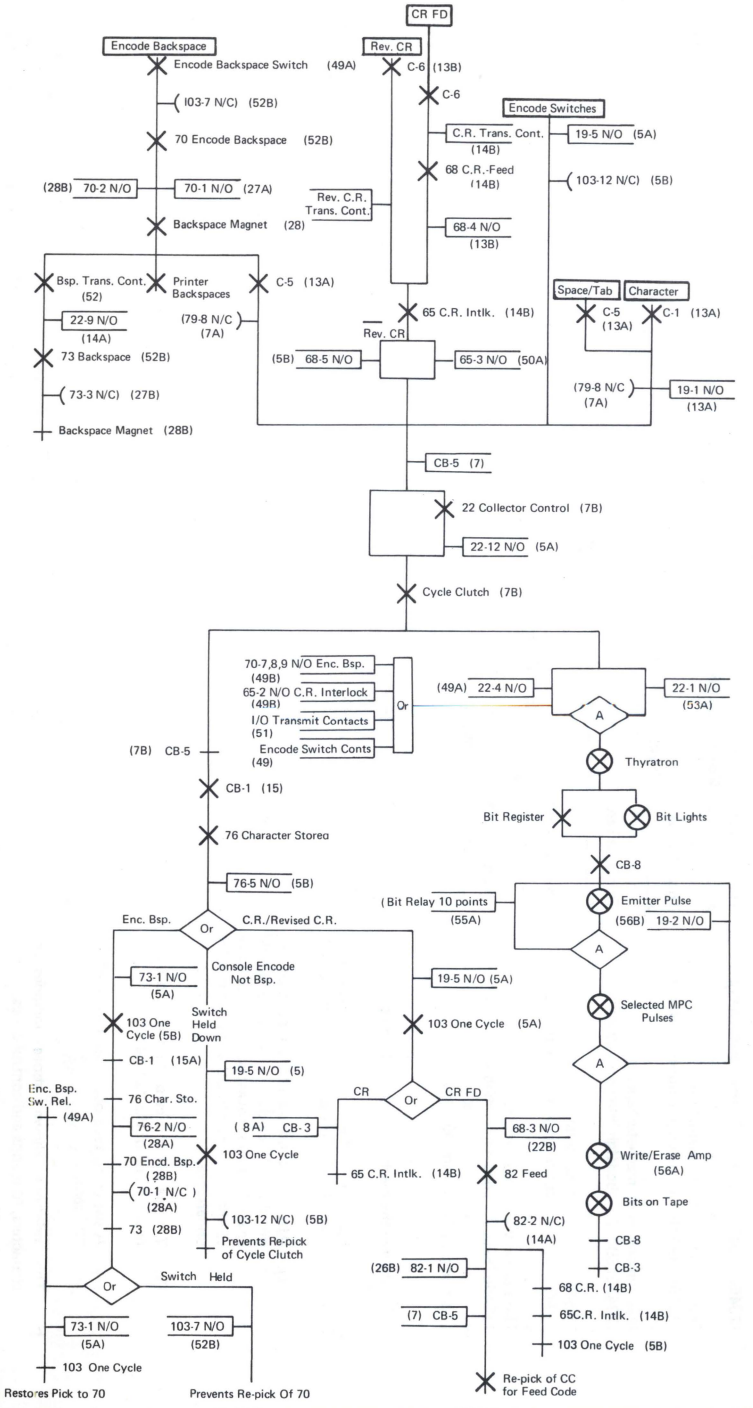
   (2) After the third tab and print-out of "x" on the "2" cards, the machine should space 10 times, backspace 10 times (back to the "x"), shift to UC and print out the underscore.

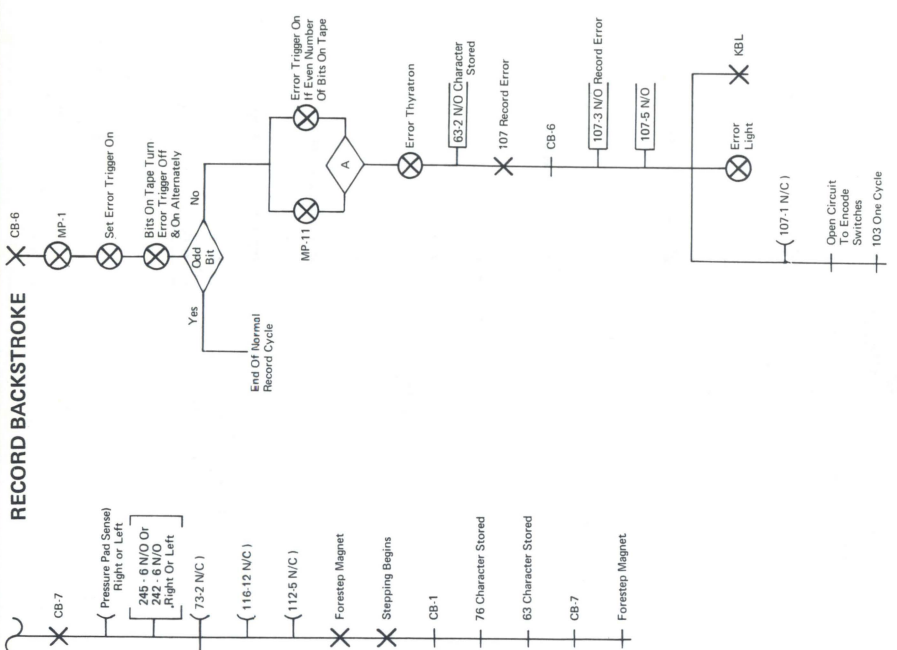
   (3) 7 single column card skips should occur near the end of the "2" card.

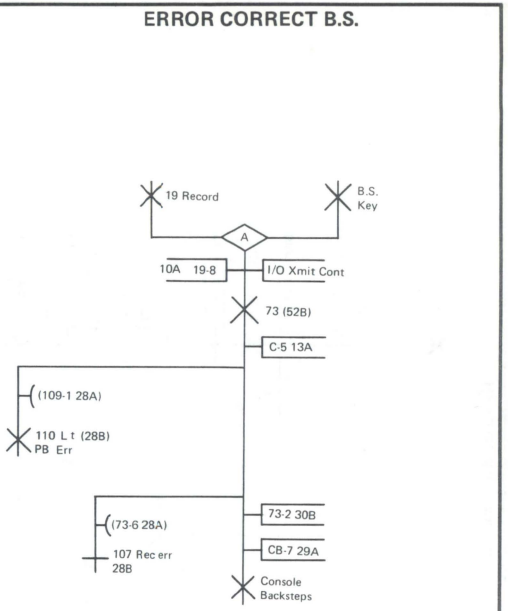
   (4) A switch to tape occurs at the end of the "2" card.

b. The print-out shown above includes all characters, functions and control codes.

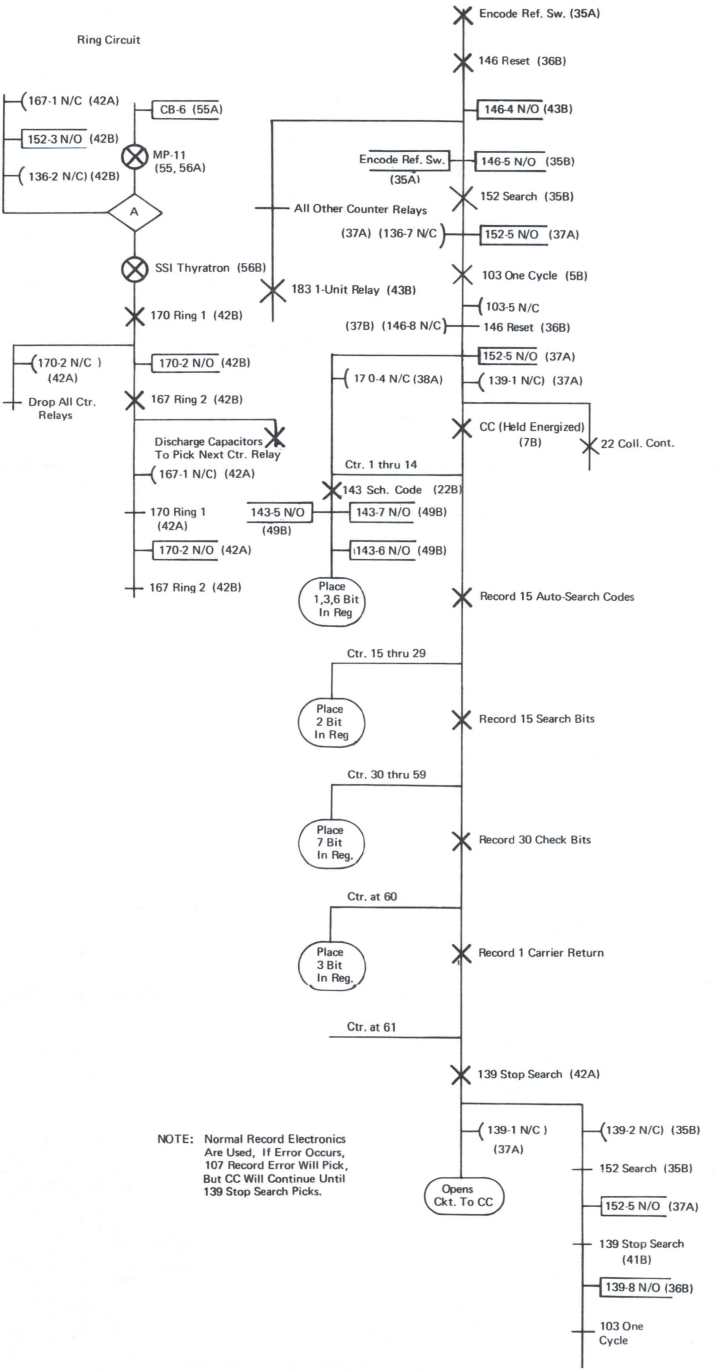
RECORD


CR FD
Encode Backspace
Encode Backspace Switch (49A)
Rev. CR
C-6 (13B)
C-6
Encode Switches
C.R. Trans. Cont. (14B)
19-5 N/O (5A)
68 C.R.-Feed (14B)
103-12 N/C) (5B)
(28B) 70-2 N/O
70-1 N/O (27A)
Rev. C.R. Trans. Cont.
68-4 N/O (13B)
103-7 N/C) (52B)
70 Encode Backspace (52B)
Backspace Magnet (28)
Bsp. Trans. Cont. (52)
Printer Backspaces
C-5 (13A)
22-9 N/O (14A)
(79-8 N/C (7A)
73 Backspace (52B)
73-3 N/C) (27B)
Backspace Magnet (28B)
65 C.R. Intlk. (14B)
Rev. CR
(5B) 68-5 N/O
65-3 N/O (50A)
Space/Tab
Character
C-5 (13A)
C-1 (13A)
(79-8 N/C (7A)
19-1 N/O (13A)
CB-5 (7)
22 Collector Control (7B)
22-12 N/O (5A)
Cycle Clutch (7B)
70-7,8,9 N/O Enc. Bsp. (49B)
65-2 N/O C.R. Interlock (49B)
I/O Transmit Contacts (51)
Encode Switch Conts (49)
Or
(49A) 22-4 N/O
A
22-1 N/O (53A)
(7B) CB-5
Thyratron
CB-1 (15)
Bit Register
Bit Lights
76 Character Stored
CB-8
76-5 N/O (5B)
(Bit Relay 10 points (55A)
Emitter Pulse (56B) 19-2 N/O
Enc. Bsp.
Or
C.R./Revised C.R.
A
73-1 N/O (5A)
Console Encode Not Bsp.
19-5 N/O (5A)
Switch Held Down
103 One Cycle (5B)
103 One Cycle (5A)
Selected MPC Pulses
CB-1 (15A)
19-5 N/O (5)
A
Enc. Bsp. Sw. Rel. (49A)
76 Char. Sto.
CR
Or
CR FD
(8A) CB-3
68-3 N/O (22B)
76-2 N/O (28A)
103 One Cycle
Write/Erase Amp (56A)
70 Encd. Bsp. (28B)
65 C.R. Intlk. (14B)
82 Feed
Bits on Tape
(70-1 N/C) (28A)
73 (28B)
103-12 N/C) (5B)
82-2 N/C) (14A)
CB-8
Prevents Re-pick of Cycle Clutch
CB-3
Or
Switch Held
(26B) 82-1 N/O
68 C.R. (14B)
(7) CB-5
65C.R. Intlk. (14B)
73-1 N/O (5A)
103-7 N/O (52B)
103 One Cycle (5B)
103 One Cycle
Re-pick of CC for Feed Code
Restores Pick to 70
Prevents Re-pick Of 70

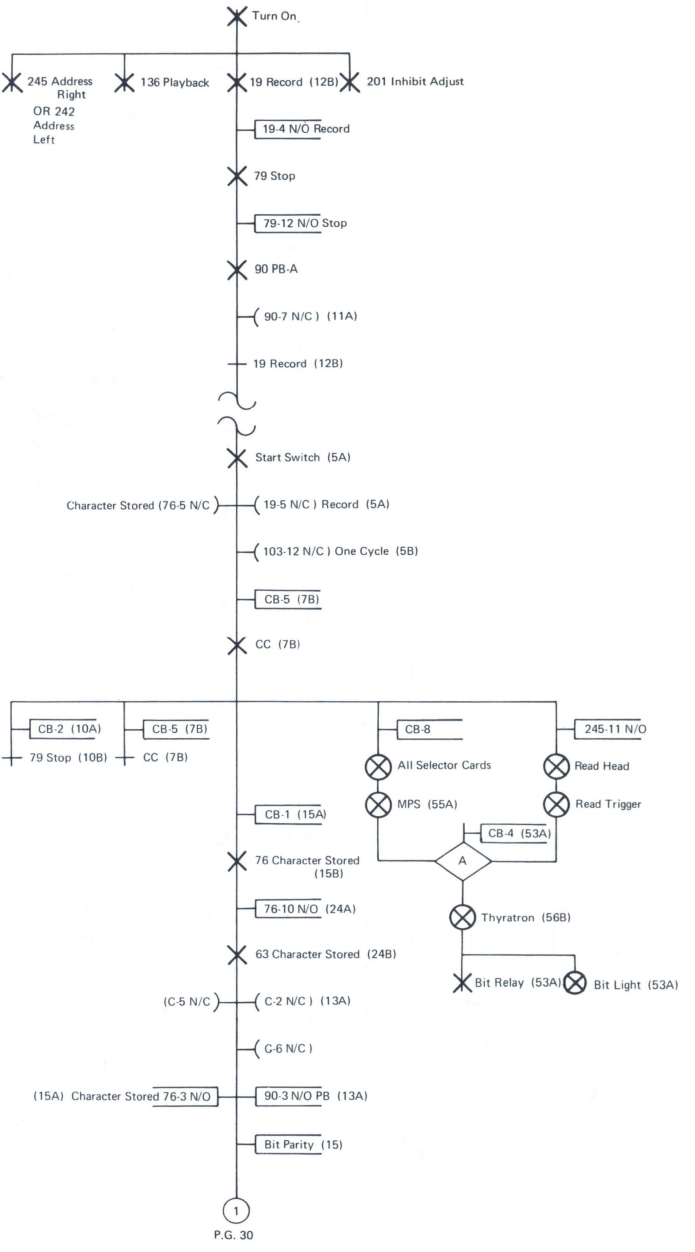

RECORD BACKSTROKE
CB-6
MP-1
Set Error Trigger On
Bits On Tape Turn Error Trigger Off & On Alternately
No
Odd Bit
Yes
End Of Normal Record Cycle
MP-11
Error Trigger On If Even Number Of Bits On Tape
A
Error Thyratron
63-2 N/O Character Stored
107 Record Error
CB-6
107-3 N/O Record Error
107-5 N/O
KBL
Error Light
107-1 N/C
Open Circuit To Encode Switches
103 One Cycle
CB-7
Pressure Pad Sense) Right or Left
245 - 6 N/O Or 242 - 6 N/O Right Or Left
73-2 N/C
(110-2 N/C
116-12 N/C)
112-5 N/C)
Forestep Magnet
Stepping Begins
CB-1
76 Character Stored
63 Character Stored
CB-7
Forestep Magnet


ERROR CORRECT B.S.
19 Record
B.S. Key
A
10A 19-8
I/O Xmit Cont
73 (52B)
C-5 13A
(109-1 28A)
110 L t (28B) PB Err
(73-6 28A)
107 Rec err 28B
73-2 30B
CB-7 29A
Console Backsteps

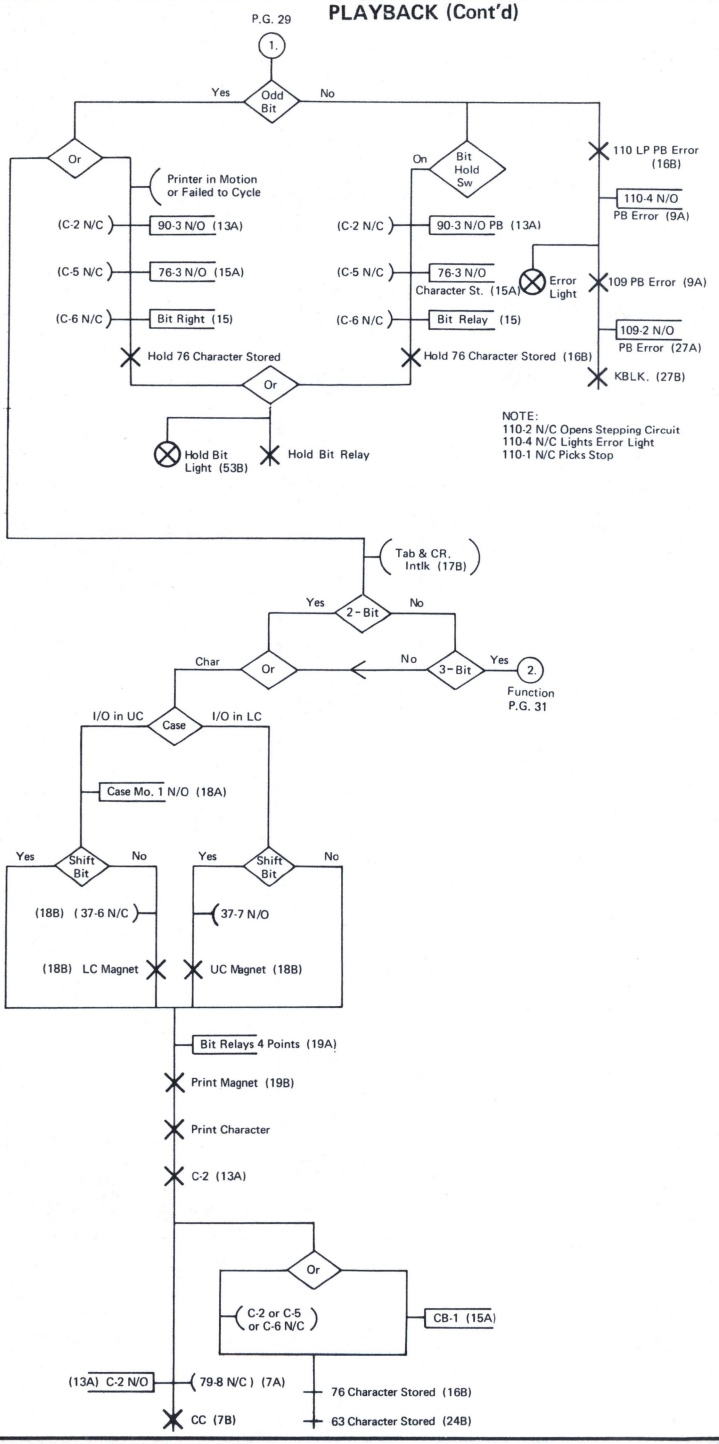
ENCODE REFERENCE



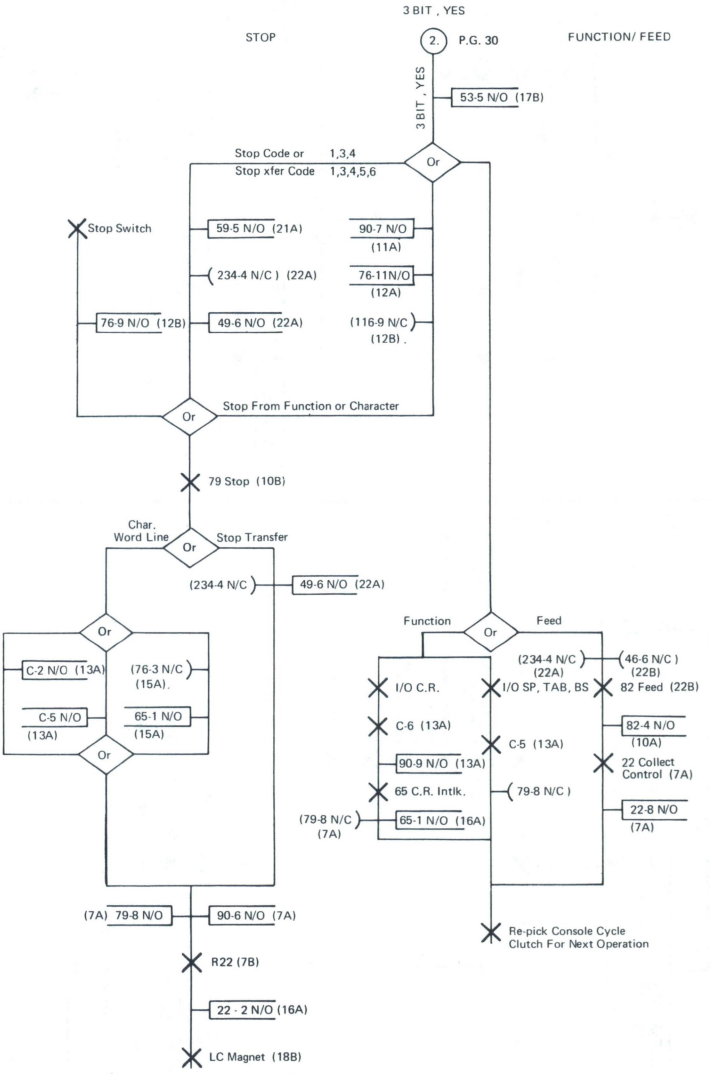
PLAYBACK


Turn On
245 Address Right
OR 242 Address Left
136 Playback
19 Record (12B)
201 Inhibit Adjust
19-4 N/O Record
79 Stop
79-12 N/O Stop
90 PB-A
90-7 N/C) (11A)
19 Record (12B)
Start Switch (5A)
Character Stored (76-5 N/C
19-5 N/C) Record (5A)
103-12 N/C) One Cycle (5B)
CB-5 (7B)
CC (7B)
CB-2 (10A)
79 Stop (10B)
CB-5 (7B)
CC (7B)
CB-8
All Selector Cards
MPS (55A)
245-11 N/O
Read Head
Read Trigger
CB-4 (53A)
A
CB-1 (15A)
76 Character Stored (15B)
76-10 N/O (24A)
Thyratron (56B)
63 Character Stored (24B)
Bit Relay (53A)
Bit Light (53A)
(C-5 N/C
C-2 N/C) (13A)
C-6 N/C)
(15A) Character Stored 76-3 N/O
90-3 N/O PB (13A)
Bit Parity (15)
1
P.G. 30

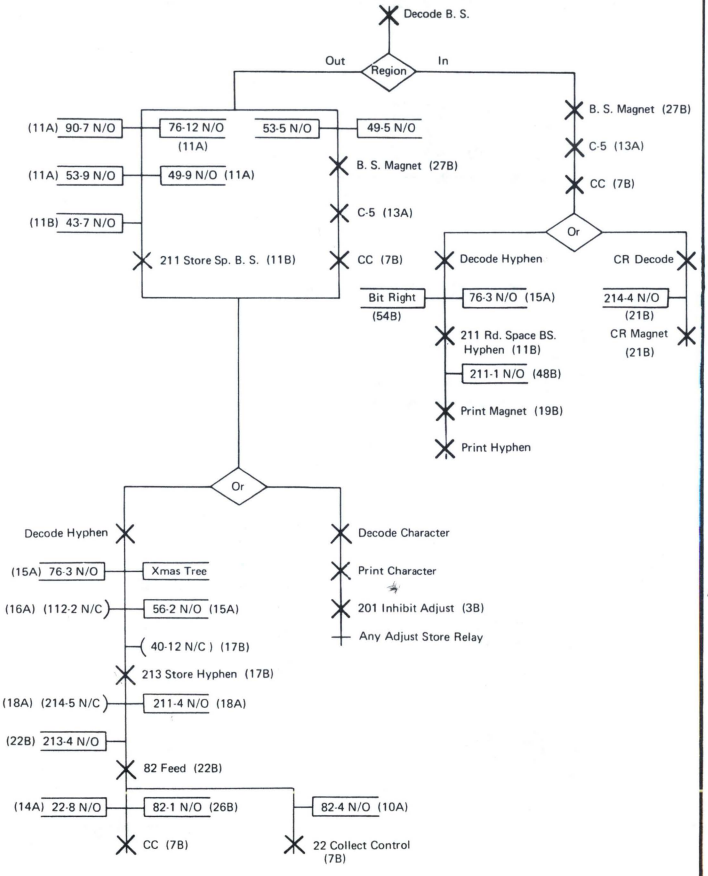
PLAYBACK (Cont'd)



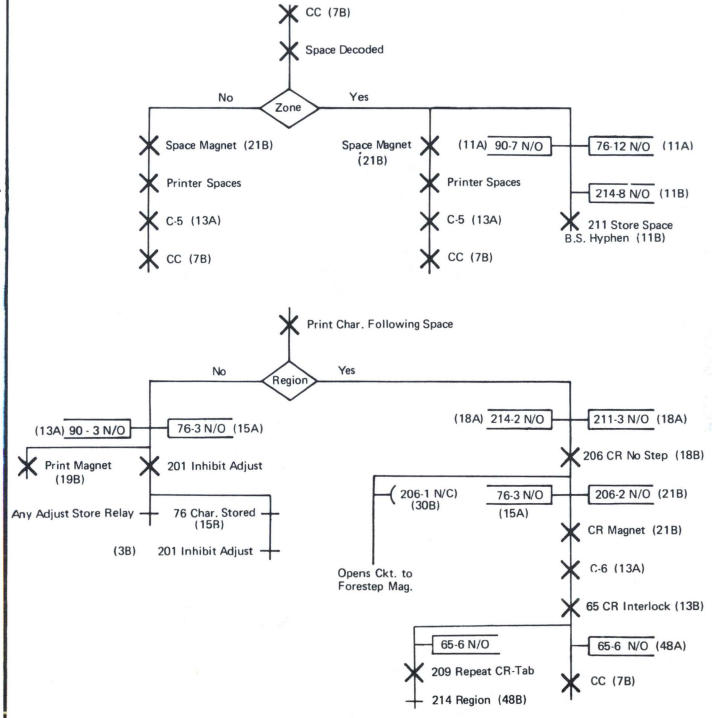
PLAYBACK (Cont'd)



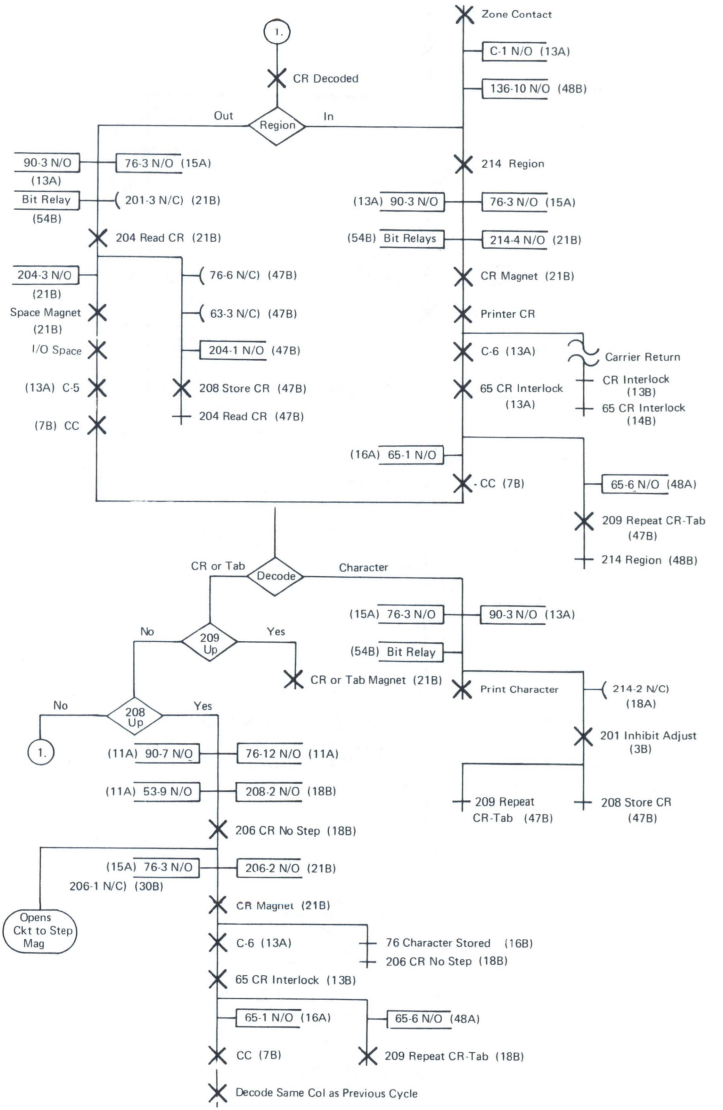
ADJUST HYPHEN

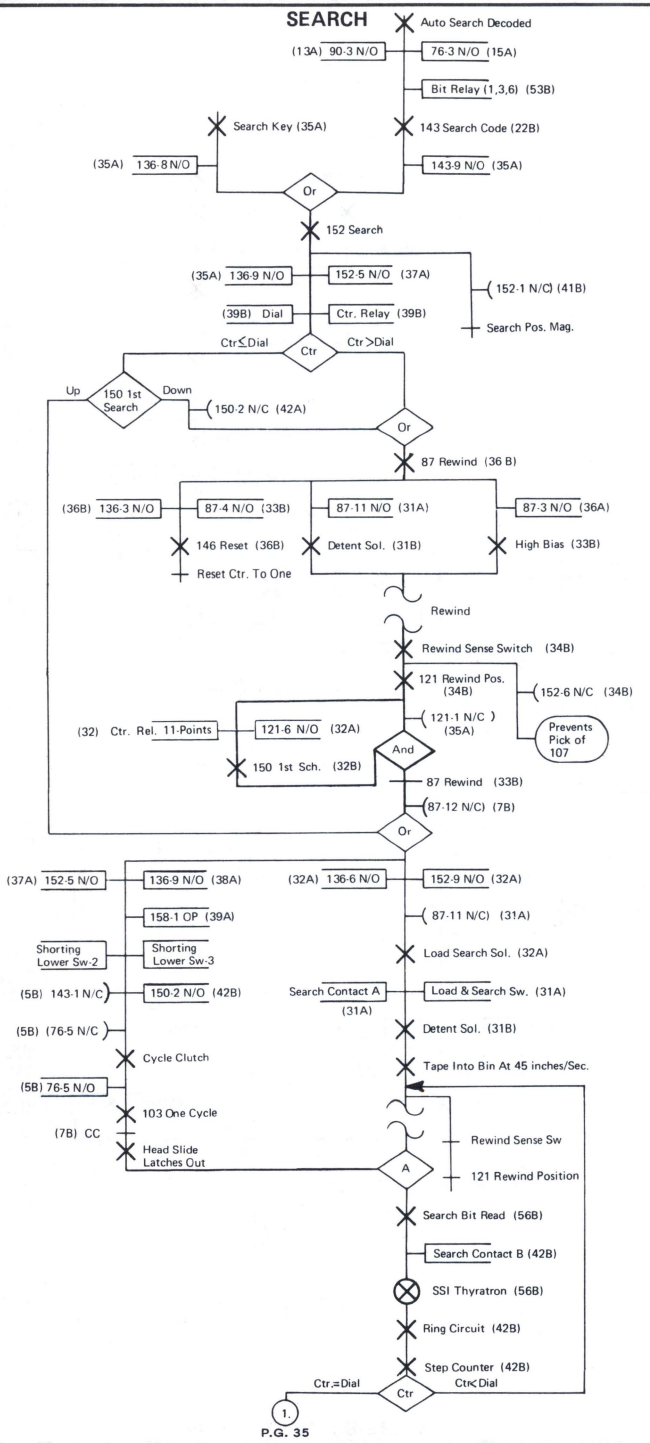


ADJUST SPACE

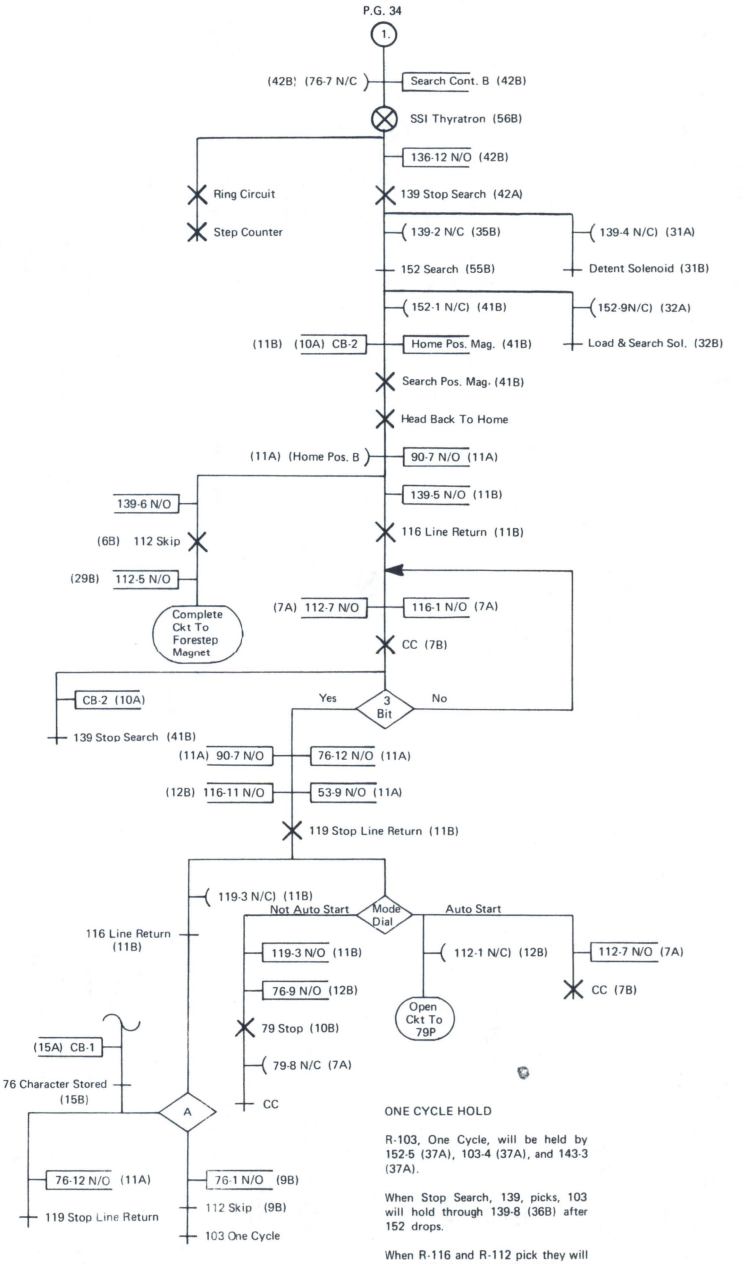


ADJUST CARRIER RETURN




SEARCH
Auto Search Decoded
(13A) 90-3 N/O
76-3 N/O (15A)
Bit Relay (1,3,6) (53B)
Search Key (35A)
143 Search Code (22B)
(35A) 136-8 N/O
143-9 N/O (35A)
Or
152 Search
(35A) 136-9 N/O
152-5 N/O (37A)
152-1 N/C) (41B)
(39B) Dial
Ctr. Relay (39B)
Search Pos. Mag.
Ctr≤Dial
Ctr
Ctr>Dial
Up
150 1st Search
Down
150-2 N/C (42A)
Or
87 Rewind (36 B)
(36B) 136-3 N/O
87-4 N/O (33B)
87-11 N/O (31A)
87-3 N/O (36A)
146 Reset (36B)
Detent Sol. (31B)
High Bias (33B)
Reset Ctr. To One
Rewind
Rewind Sense Switch (34B)
121 Rewind Pos. (34B)
152-6 N/C (34B)
121-1 N/C) (35A)
Prevents Pick of 107
(32) Ctr. Rel. 11-Points
121-6 N/O (32A)
And
150 1st Sch. (32B)
87 Rewind (33B)
(87-12 N/C) (7B)
Or
(37A) 152-5 N/O
136-9 N/O (38A)
(32A) 136-6 N/O
152-9 N/O (32A)
158-1 OP (39A)
(87-11 N/C) (31A)
Shorting Lower Sw-2
Shorting Lower Sw-3
Load Search Sol. (32A)
(5B) 143-1 N/C
150-2 N/O (42B)
Search Contact A (31A)
Load & Search Sw. (31A)
(5B) (76-5 N/C
Detent Sol. (31B)
Cycle Clutch
Tape Into Bin At 45 inches/Sec.
(5B) 76-5 N/O
103 One Cycle
(7B) CC
Head Slide Latches Out
Rewind Sense Sw
A
121 Rewind Position
Search Bit Read (56B)
Search Contact B (42B)
SSI Thyratron (56B)
Ring Circuit (42B)
Step Counter (42B)
Ctr.=Dial
Ctr
Ctr<Dial
1.
P.G. 35

SEARCH (Cont'd)



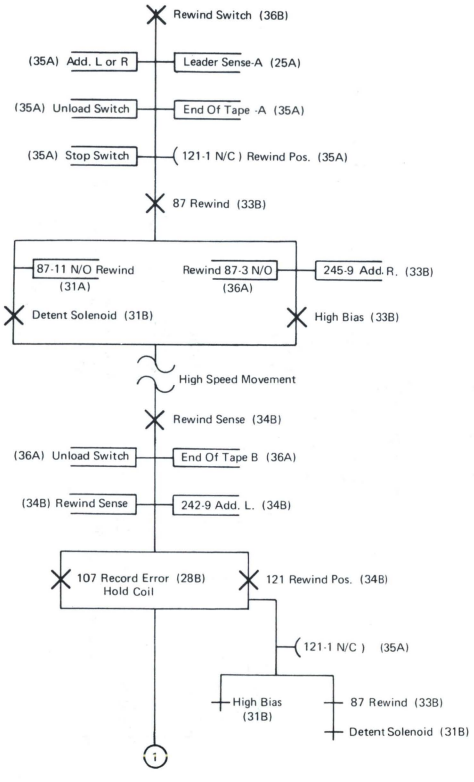
ONE CYCLE HOLD

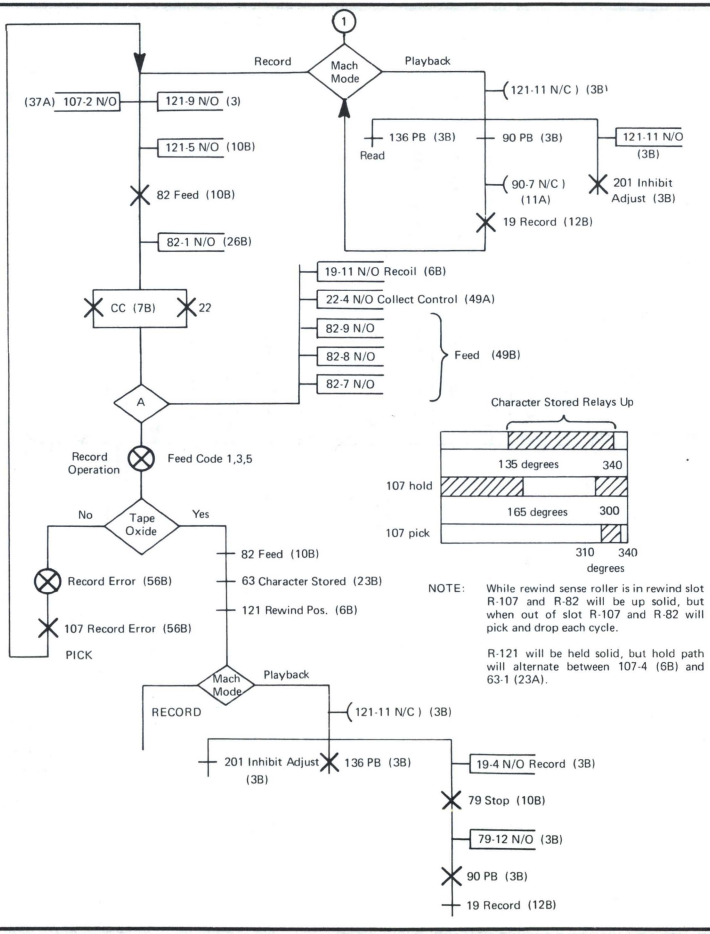
R-103, One Cycle, will be held by 152-5 (37A), 103-4 (37A), and 143-3 (37A).

When Stop Search, 139, picks, 103 will hold through 139-8 (36B) after 152 drops.

When R-116 and R-112 pick they will hold 103 through 112-8 (5A) and 116-2 (5A).

REWIND

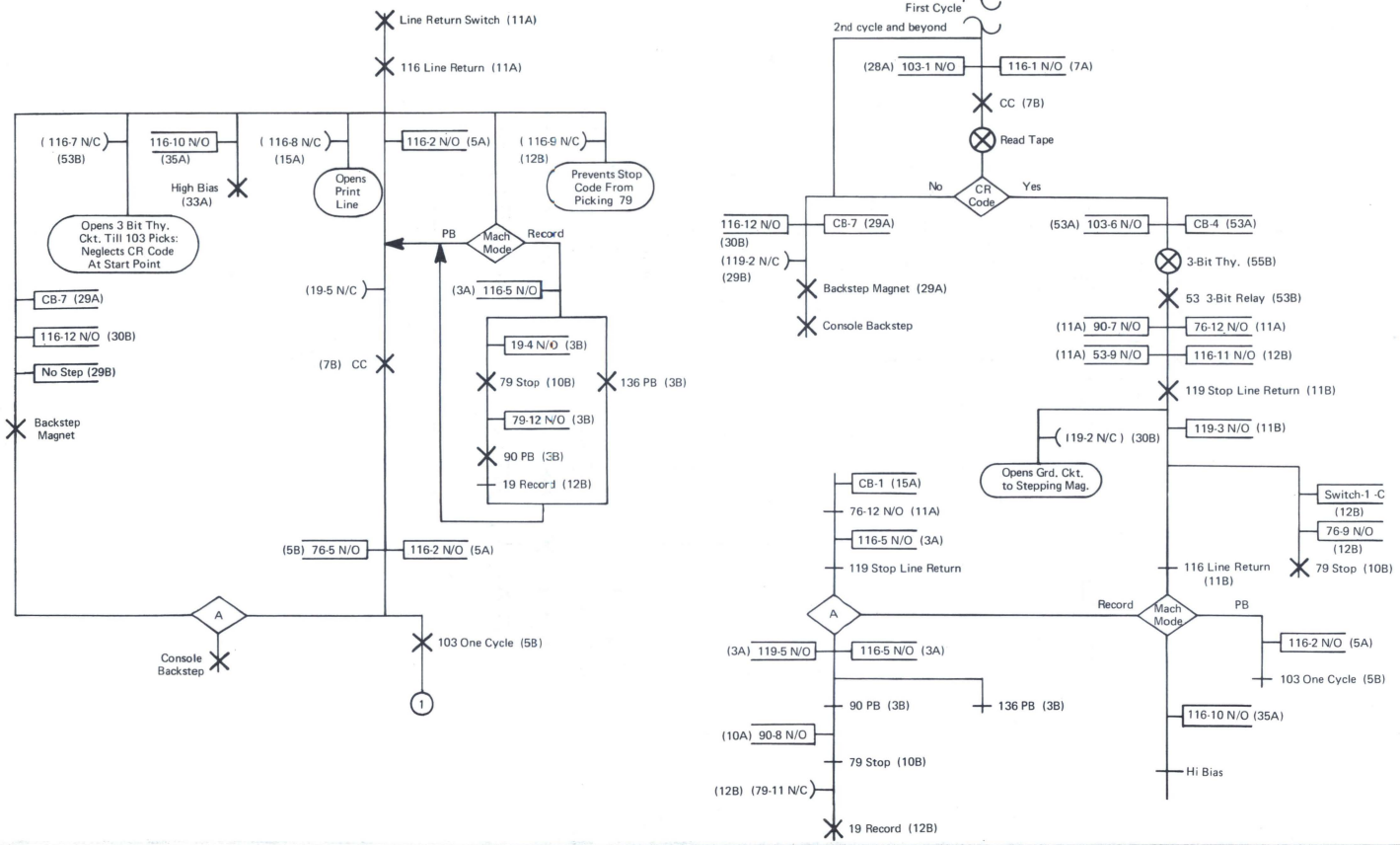




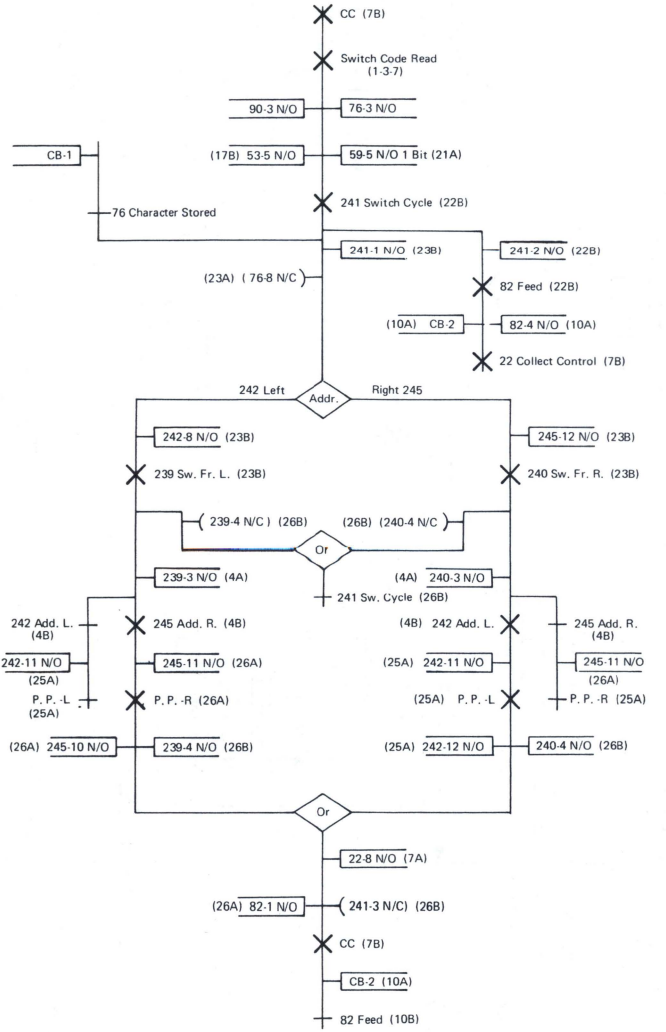
NOTE: While rewind sense roller is in rewind slot R-107 and R-82 will be up solid, but when out of slot R-107 and R-82 will pick and drop each cycle.

R-121 will be held solid, but hold path will alternate between 107-4 (6B) and 63-1 (23A).

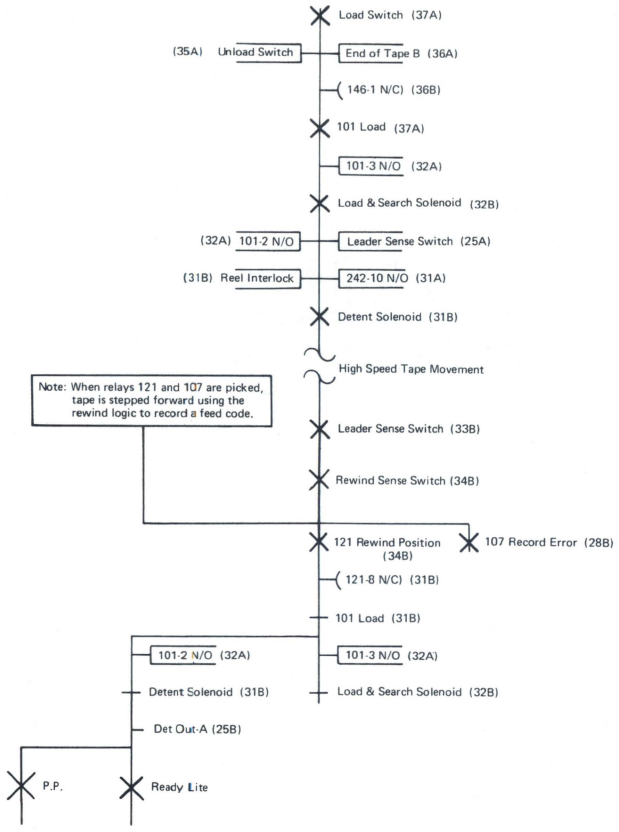
LINE RETURN


Line Return Switch (11A)
116 Line Return (11A)
(116-7 N/C (53B)
116-10 N/O (35A)
(116-8 N/C (15A)
116-2 N/O (5A)
(116-9 N/C (12B)
High Bias (33A)
Opens Print Line
Prevents Stop Code From Picking 79
Opens 3 Bit Thy. Ckt. Till 103 Picks: Neglects CR Code At Start Point
PB
Mach Mode
Record
CB-7 (29A)
116-12 N/O (30B)
No Step (29B)
Backstep Magnet
(19-5 N/C
(3A) 116-5 N/O
19-4 N/O (3B)
(7B) CC
79 Stop (10B)
136 PB (3B)
79-12 N/O (3B)
90 PB (3B)
19 Record (12B)
(5B) 76-5 N/O
116-2 N/O (5A)
A
Console Backstep
103 One Cycle (5B)
1
First Cycle
2nd cycle and beyond
(28A) 103-1 N/O
116-1 N/O (7A)
CC (7B)
Read Tape
No
CR Code
Yes
116-12 N/O (30B)
(119-2 N/C (29B)
CB-7 (29A)
Backstep Magnet (29A)
Console Backstep
(53A) 103-6 N/O
CB-4 (53A)
3-Bit Thy. (55B)
53 3-Bit Relay (53B)
(11A) 90-7 N/O
76-12 N/O (11A)
(11A) 53-9 N/O
116-11 N/O (12B)
119 Stop Line Return (11B)
(119-2 N/C) (30B)
119-3 N/O (11B)
Opens Grd. Ckt. to Stepping Mag.
CB-1 (15A)
76-12 N/O (11A)
116-5 N/O (3A)
119 Stop Line Return
Switch-1 -C (12B)
76-9 N/O (12B)
79 Stop (10B)
116 Line Return (11B)
A
Record
Mach Mode
PB
(3A) 119-5 N/O
116-5 N/O (3A)
116-2 N/O (5A)
103 One Cycle (5B)
90 PB (3B)
136 PB (3B)
116-10 N/O (35A)
(10A) 90-8 N/O
79 Stop (10B)
Hi Bias
(12B) (79-11 N/C
19 Record (12B)

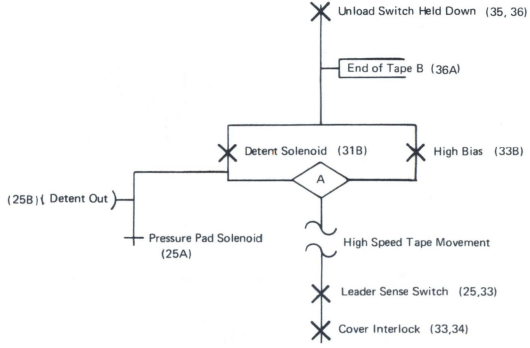
SWITCH


CC (7B)
Switch Code Read (1-3-7)
90-3 N/O
76-3 N/O
CB-1
(17B) 53-5 N/O
59-5 N/O 1 Bit (21A)
241 Switch Cycle (22B)
76 Character Stored
241-1 N/O (23B)
241-2 N/O (22B)
(23A) (76-8 N/C)
82 Feed (22B)
(10A) CB-2
82-4 N/O (10A)
22 Collect Control (7B)
242 Left
Addr.
Right 245
242-8 N/O (23B)
245-12 N/O (23B)
239 Sw. Fr. L. (23B)
240 Sw. Fr. R. (23B)
(239-4 N/C) (26B)
(26B) (240-4 N/C)
Or
239-3 N/O (4A)
(4A) 240-3 N/O
241 Sw. Cycle (26B)
242 Add. L. (4B)
245 Add. R. (4B)
(4B) 242 Add. L.
245 Add. R. (4B)
242-11 N/O (25A)
245-11 N/O (26A)
(25A) 242-11 N/O
245-11 N/O (26A)
P. P. -L (25A)
P. P. -R (26A)
(25A) P. P. -L
P. P. -R (25A)
(26A) 245-10 N/O
239-4 N/O (26B)
(25A) 242-12 N/O
240-4 N/O (26B)
Or
22-8 N/O (7A)
(26A) 82-1 N/O
(241-3 N/C) (26B)
CC (7B)
CB-2 (10A)
82 Feed (10B)

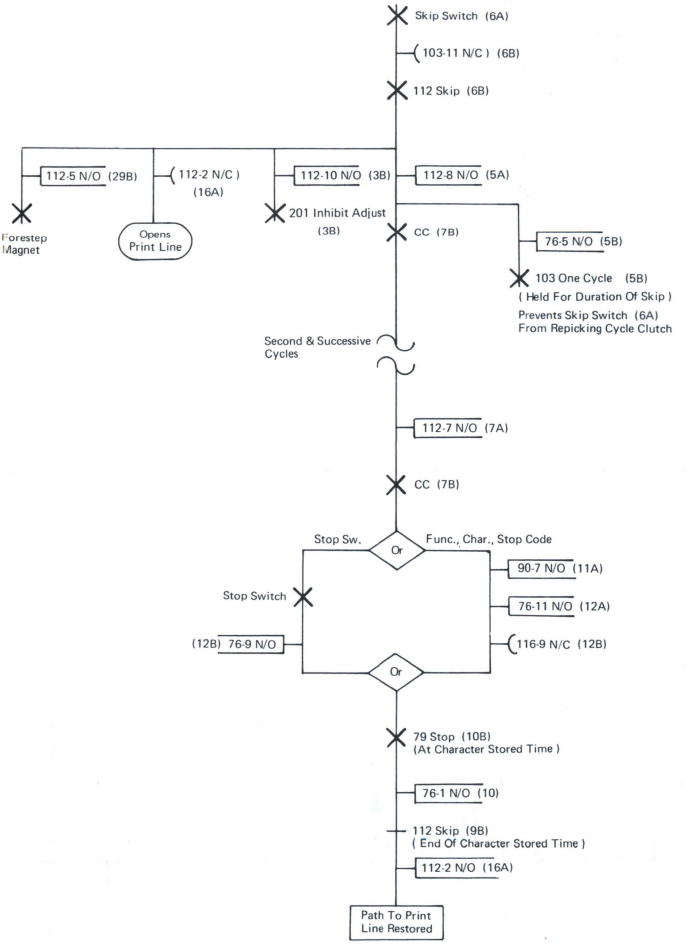
LOAD


Load Switch (37A)
(35A) Unload Switch
End of Tape B (36A)
146-1 N/C) (36B)
101 Load (37A)
101-3 N/O (32A)
Load & Search Solenoid (32B)
(32A) 101-2 N/O
Leader Sense Switch (25A)
(31B) Reel Interlock
242-10 N/O (31A)
Detent Solenoid (31B)
High Speed Tape Movement
Note: When relays 121 and 107 are picked, tape is stepped forward using the rewind logic to record a feed code.
Leader Sense Switch (33B)
Rewind Sense Switch (34B)
121 Rewind Position (34B)
107 Record Error (28B)
121-8 N/C) (31B)
101 Load (31B)
101-2 N/O (32A)
101-3 N/O (32A)
Detent Solenoid (31B)
Load & Search Solenoid (32B)
Det Out-A (25B)
P.P.
Ready Lite

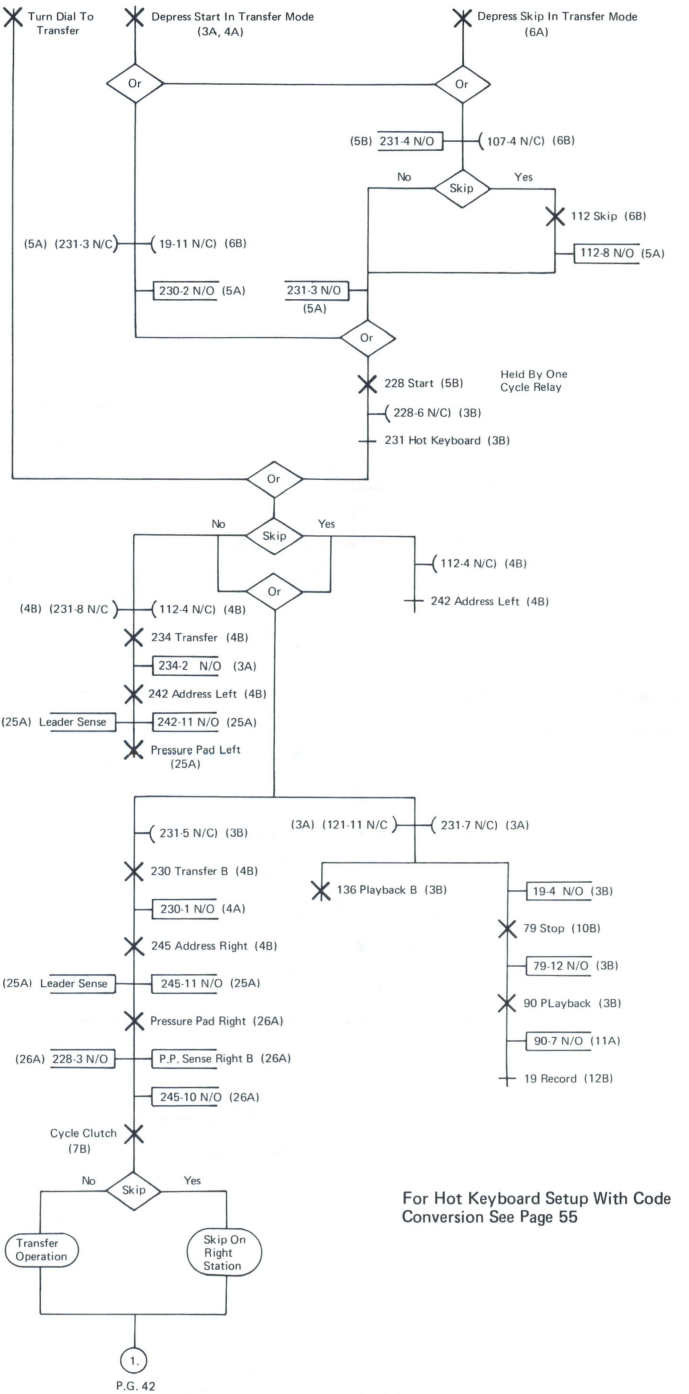
UNLOAD


Unload Switch Held Down (35, 36)
End of Tape B (36A)
Detent Solenoid (31B)
High Bias (33B)
A
(25B) Detent Out
Pressure Pad Solenoid (25A)
High Speed Tape Movement
Leader Sense Switch (25,33)
Cover Interlock (33,34)

SKIP

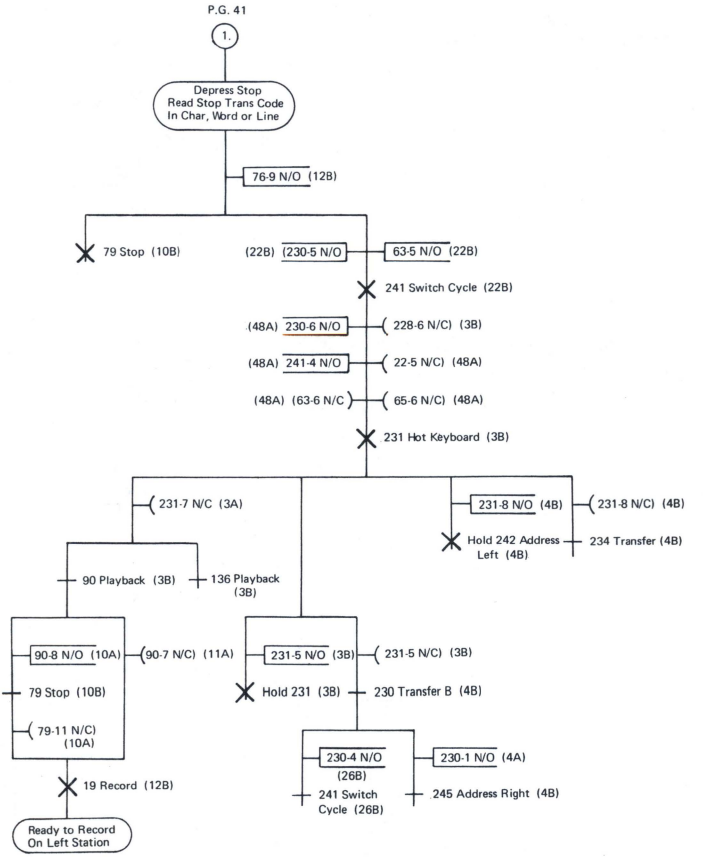

Skip Switch (6A)
103-11 N/C) (6B)
112 Skip (6B)
112-5 N/O (29B)
Forestep Magnet
112-2 N/C) (16A)
Opens Print Line
112-10 N/O (3B)
201 Inhibit Adjust (3B)
112-8 N/O (5A)
CC (7B)
76-5 N/O (5B)
103 One Cycle (5B)
(Held For Duration Of Skip)
Prevents Skip Switch (6A) From Repicking Cycle Clutch
Second & Successive Cycles
112-7 N/O (7A)
CC (7B)
Stop Sw.
Or
Func., Char., Stop Code
90-7 N/O (11A)
Stop Switch
76-11 N/O (12A)
(12B) 76-9 N/O
116-9 N/C (12B)
Or
79 Stop (10B)
(At Character Stored Time)
76-1 N/O (10)
112 Skip (9B)
(End Of Character Stored Time)
112-2 N/O (16A)
Path To Print Line Restored

HOT KEYBOARD

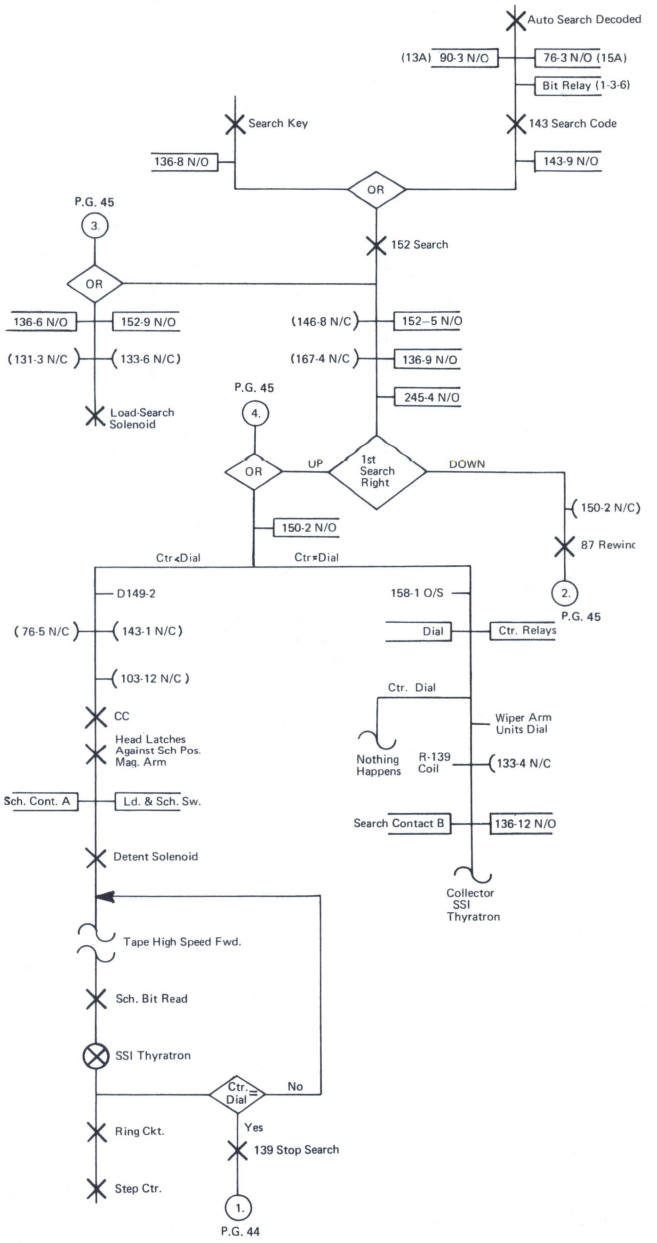


For Hot Keyboard Setup With Code Conversion See Page 55

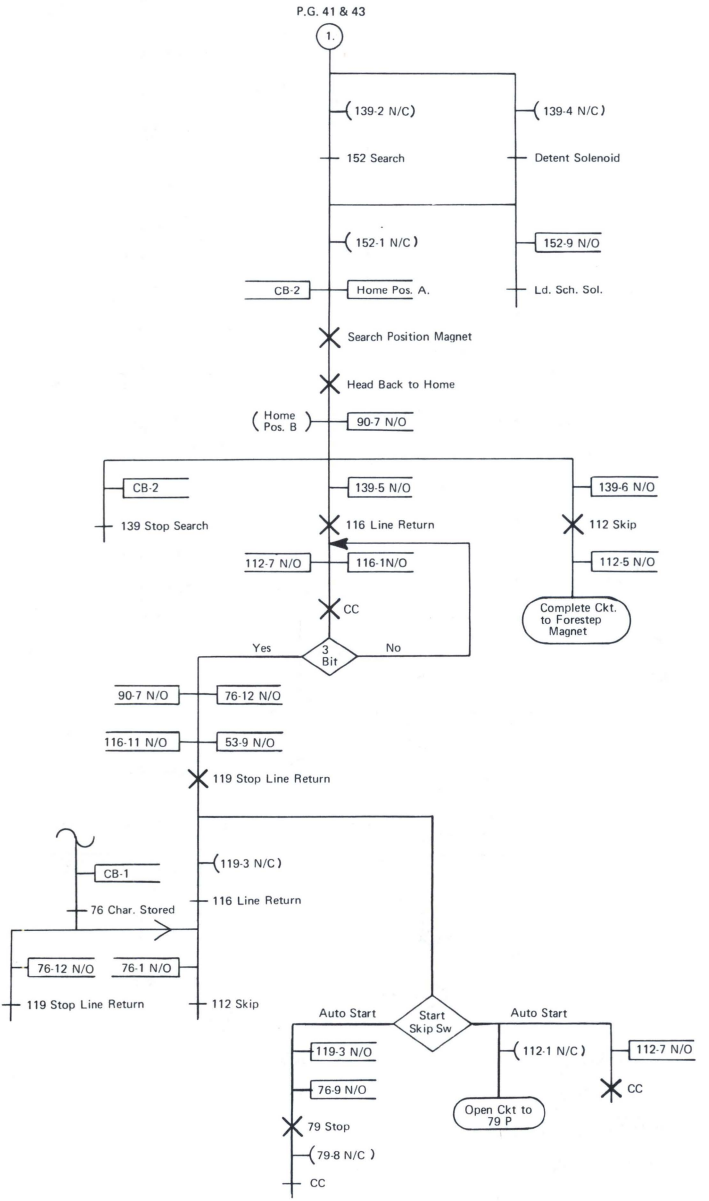
HOT KEYBOARD (Cont'd)



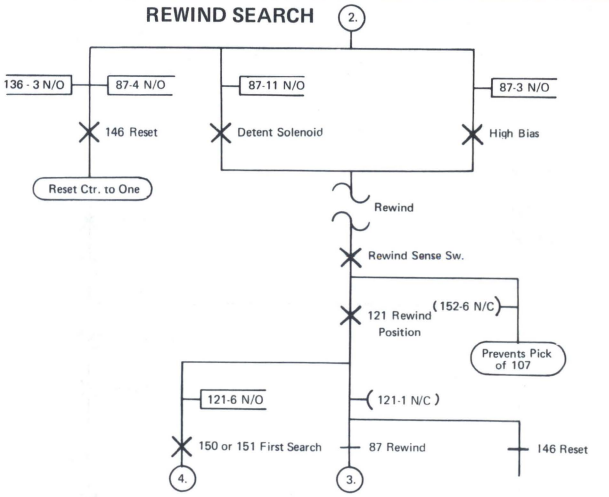
REVERSE SEARCH



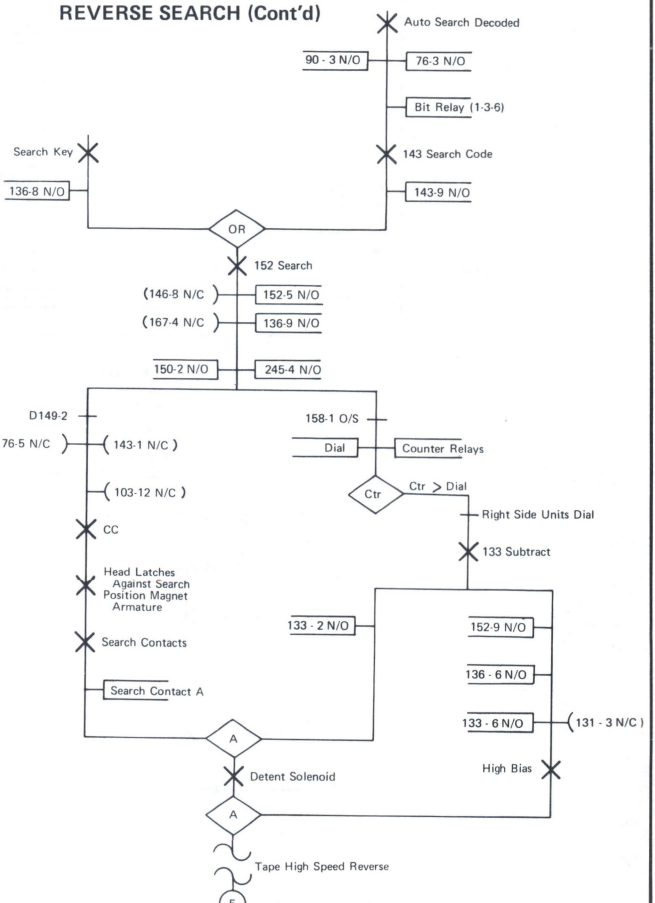
REVERSE SEARCH (Cont'd)



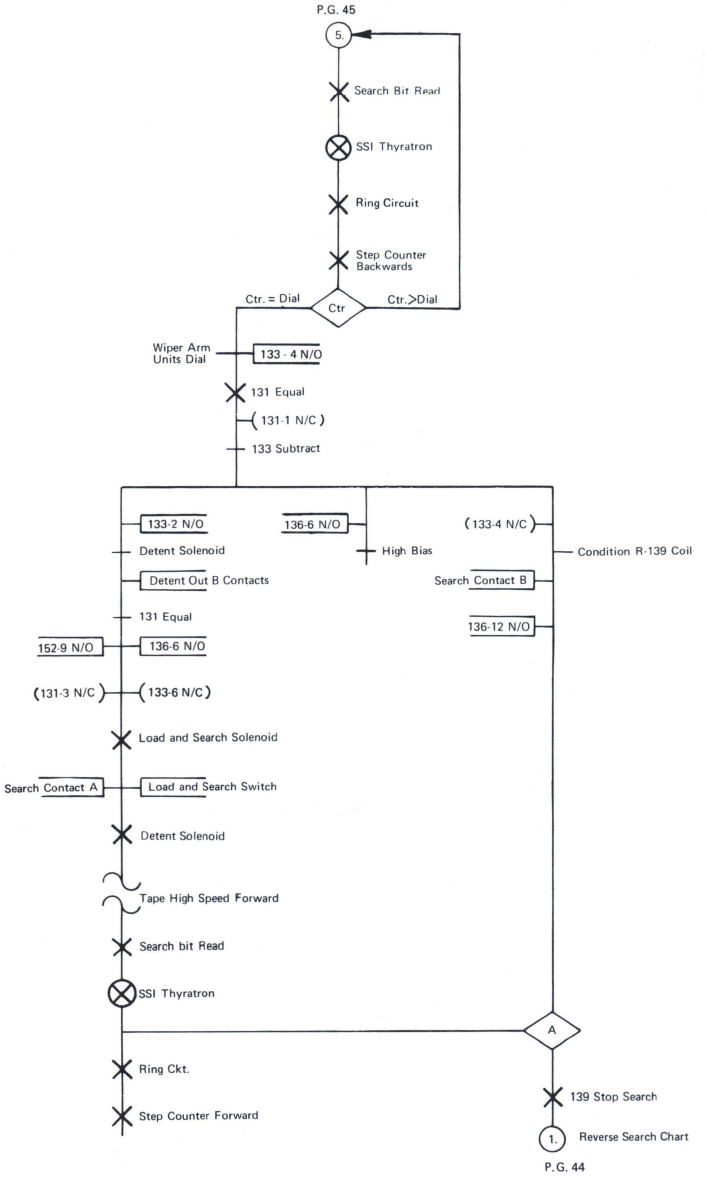
REWIND SEARCH



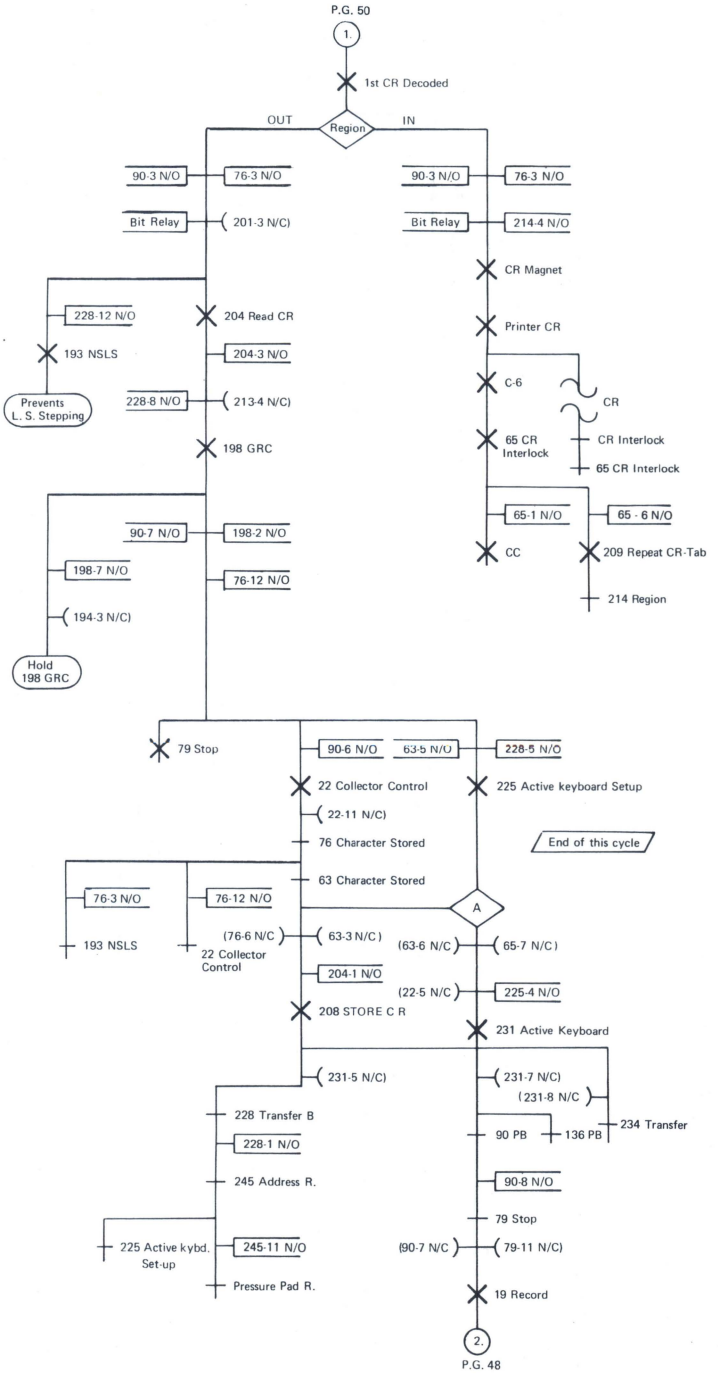
REVERSE SEARCH (Cont'd)



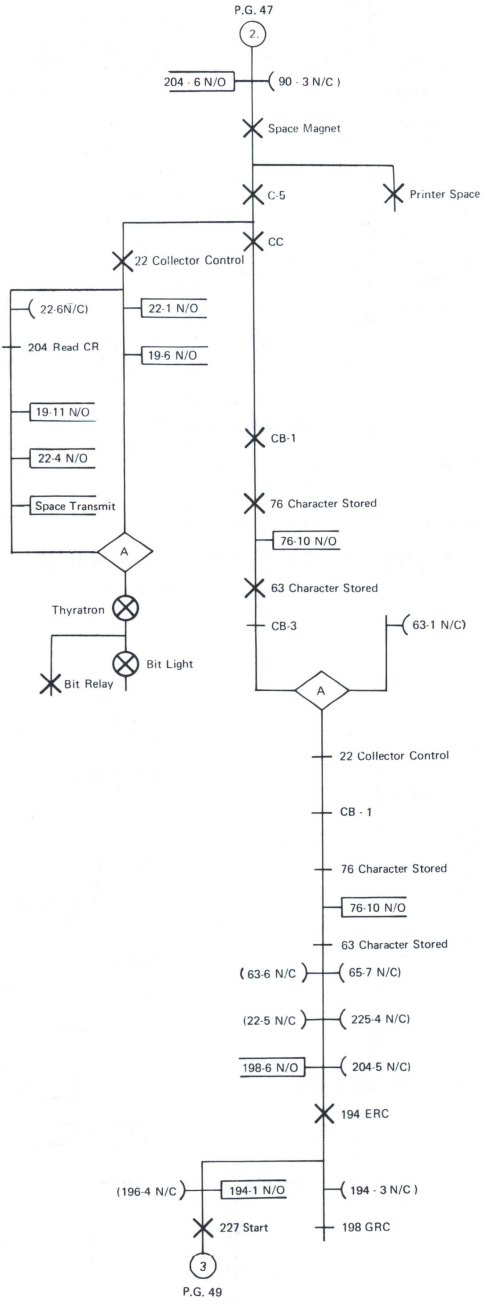
REVERSE SEARCH (Cont'd)



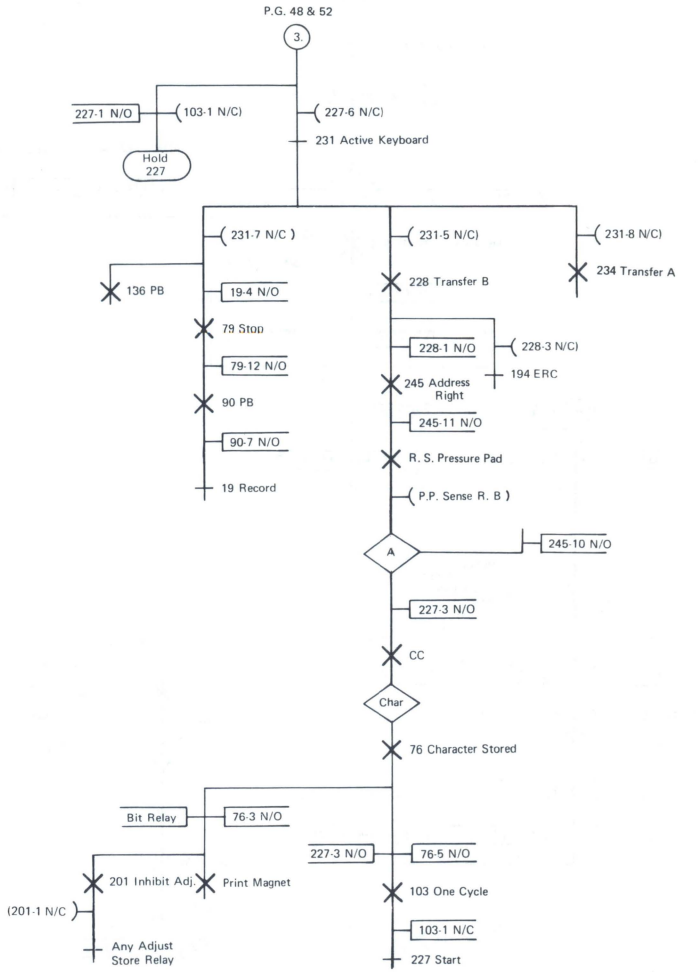
CODE CONVERSION



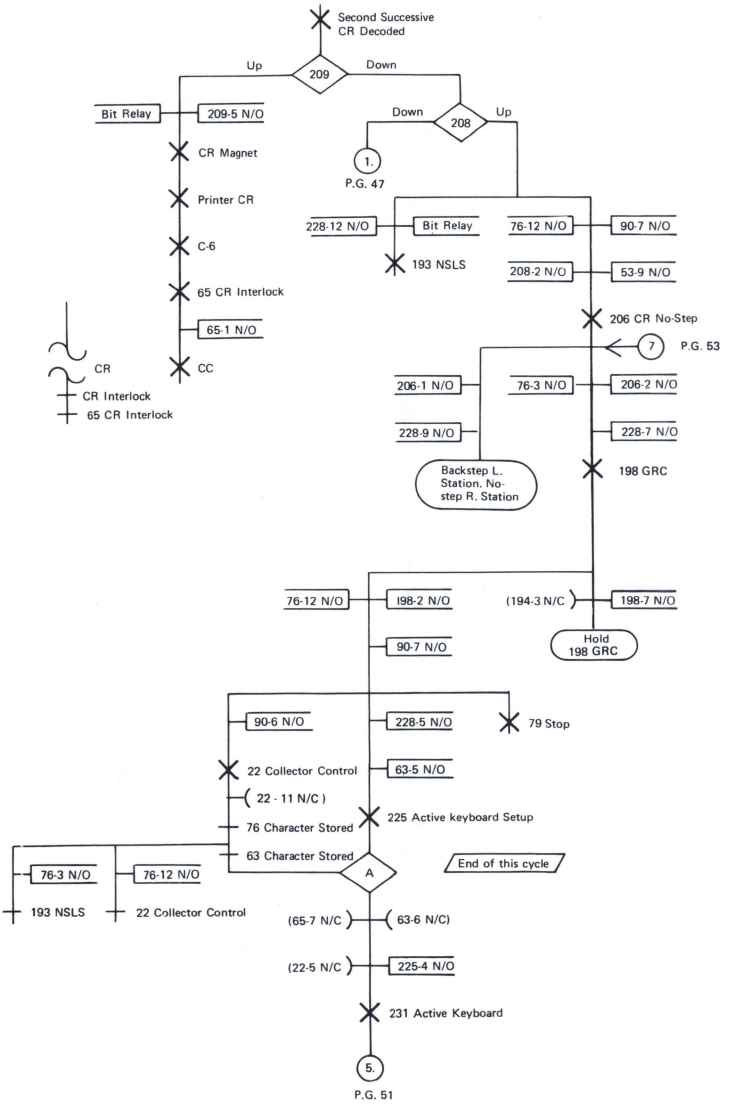
CODE CONVERSION (Cont'd)



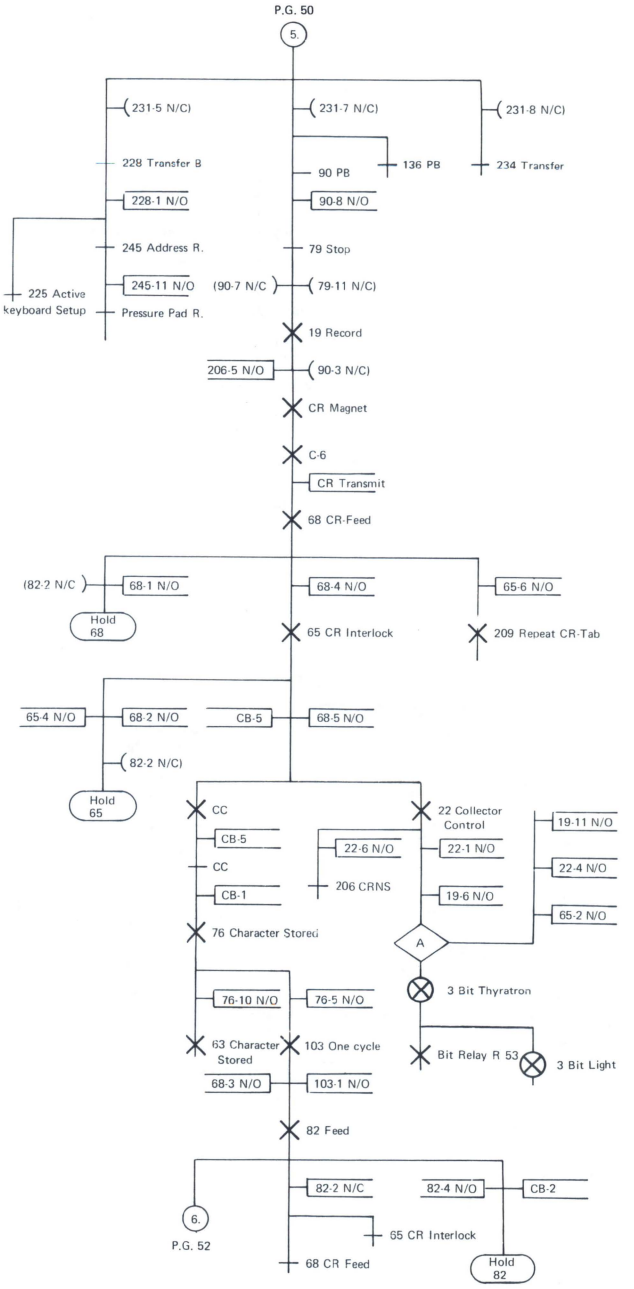
CODE CONVERSION (Cont'd)



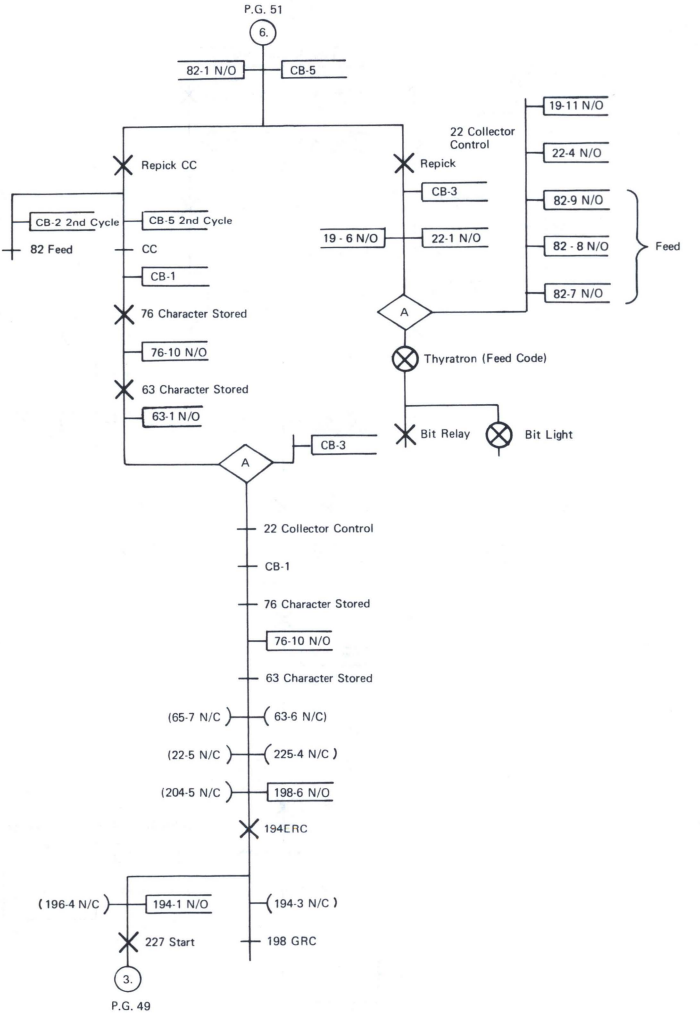
CODE CONVERSION (Cont'd)



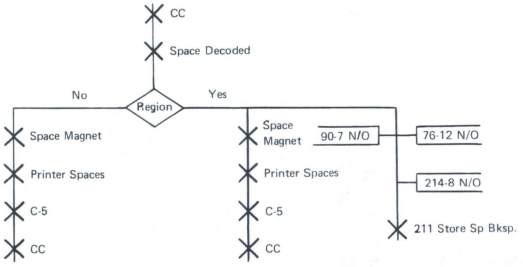
CODE CONVERSION (Cont'd)

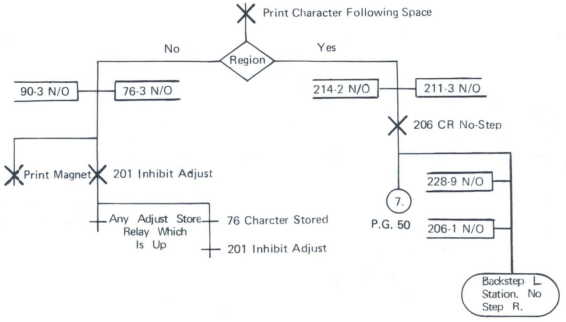


CODE CONVERSION (Cont'd)

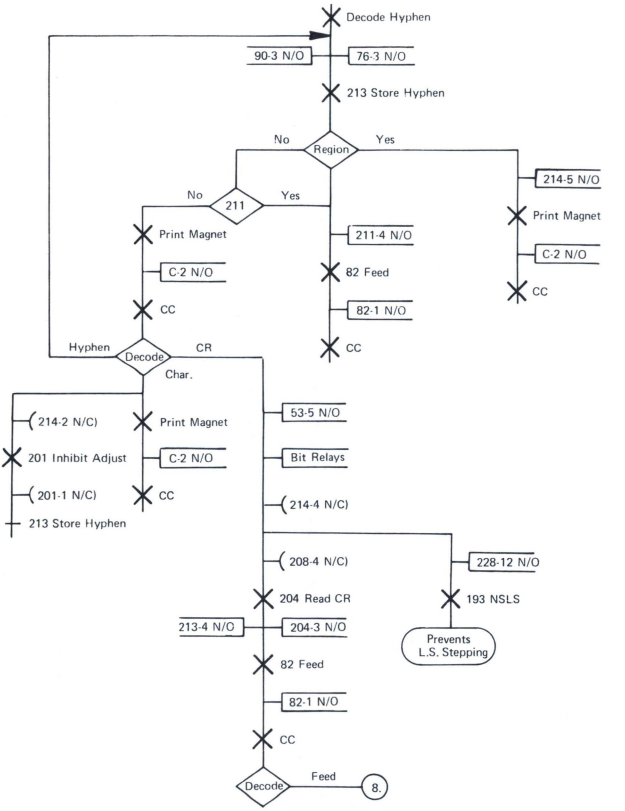


ADJUST SPACE
(Code Conversion)

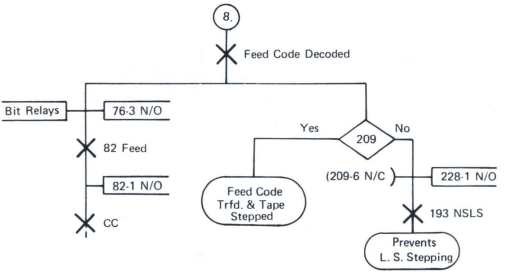


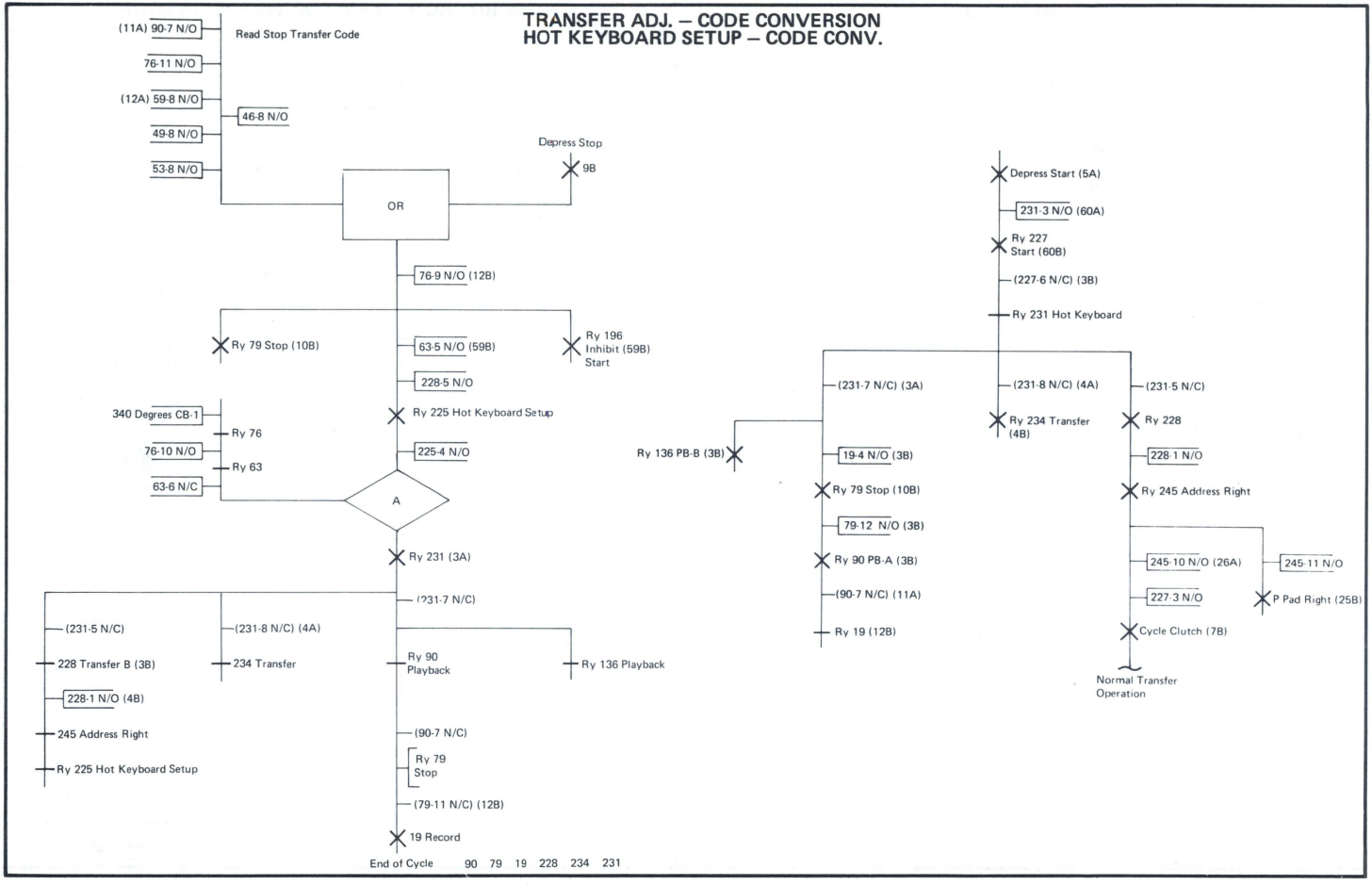


ADJUST HYPHEN
(Code Conversion)

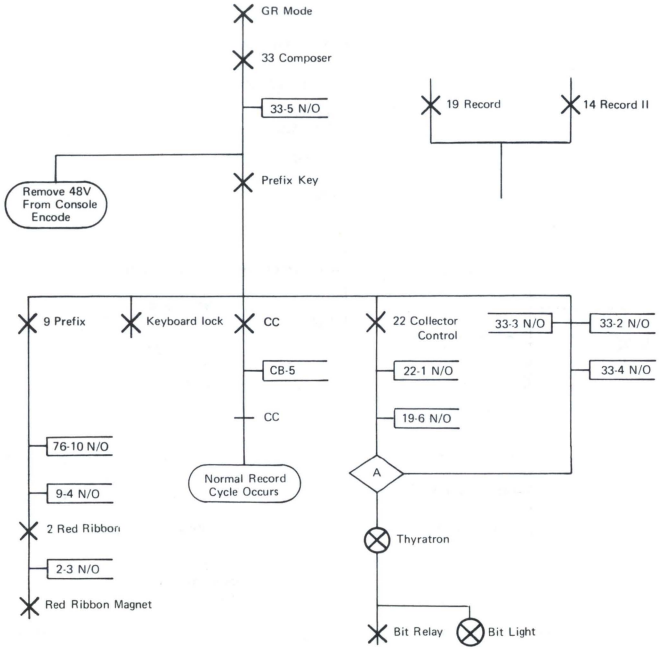


FEED CODE
(Code Conv.)

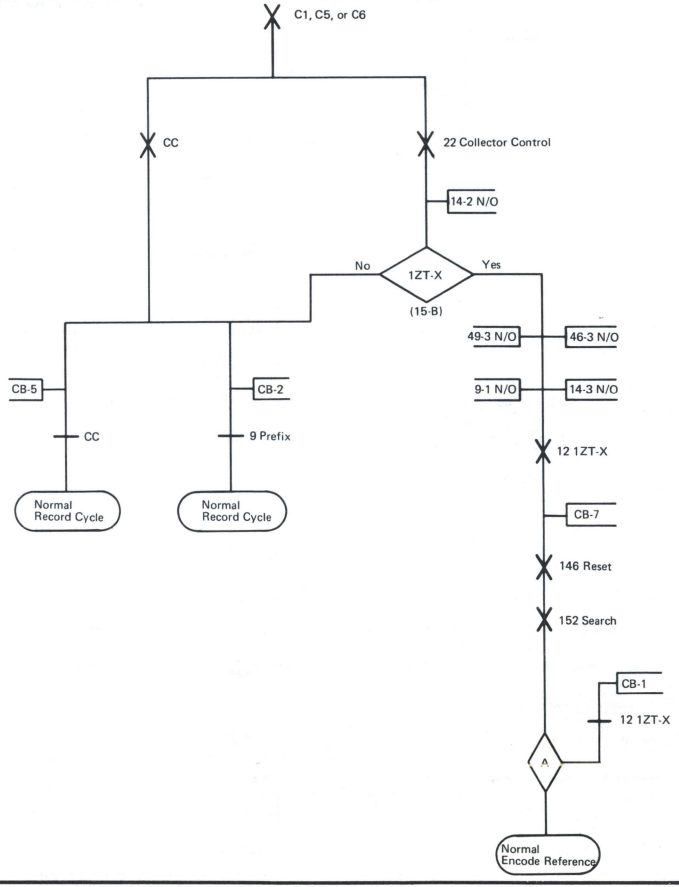



TRANSFER ADJ. – CODE CONVERSION
HOT KEYBOARD SETUP – CODE CONV.
(11A) 90-7 N/O
Read Stop Transfer Code
76-11 N/O
(12A) 59-8 N/O
46-8 N/O
49-8 N/O
53-8 N/O
OR
Depress Stop
9B
76-9 N/O (12B)
Ry 79 Stop (10B)
63-5 N/O (59B)
Ry 196 Inhibit (59B) Start
228-5 N/O
340 Degrees CB-1
Ry 76
76-10 N/O
Ry 63
63-6 N/C
Ry 225 Hot Keyboard Setup
225-4 N/O
A
Ry 231 (3A)
(231-7 N/C)
(231-5 N/C)
228 Transfer B (3B)
228-1 N/O (4B)
245 Address Right
Ry 225 Hot Keyboard Setup
(231-8 N/C) (4A)
234 Transfer
Ry 90 Playback
Ry 136 Playback
(90-7 N/C)
Ry 79 Stop
(79-11 N/C) (12B)
19 Record
End of Cycle 90 79 19 228 234 231
Depress Start (5A)
231-3 N/O (60A)
Ry 227 Start (60B)
(227-6 N/C) (3B)
Ry 231 Hot Keyboard
(231-7 N/C) (3A)
Ry 136 PB-B (3B)
19-4 N/O (3B)
Ry 79 Stop (10B)
79-12 N/O (3B)
Ry 90 PB-A (3B)
(90-7 N/C) (11A)
Ry 19 (12B)
(231-8 N/C) (4A)
Ry 234 Transfer (4B)
(231-5 N/C)
Ry 228
228-1 N/O
Ry 245 Address Right
245-10 N/O (26A)
245-11 N/O
227-3 N/O
P Pad Right (25B)
Cycle Clutch (7B)
Normal Transfer Operation

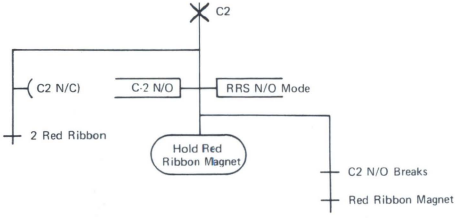
RECORD PREFIX CODE



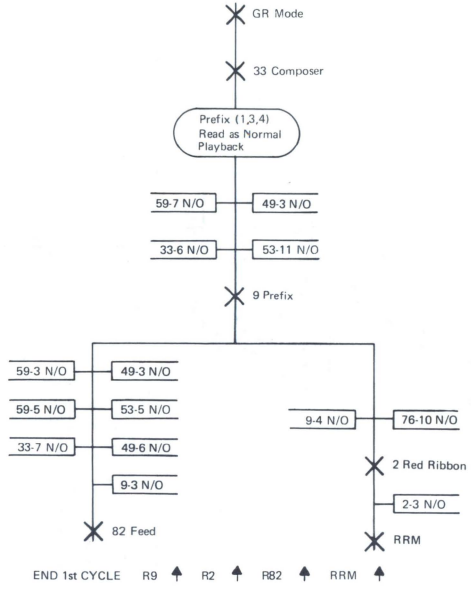
RECORD FROM I/O FOLLOWING PREFIX CODE



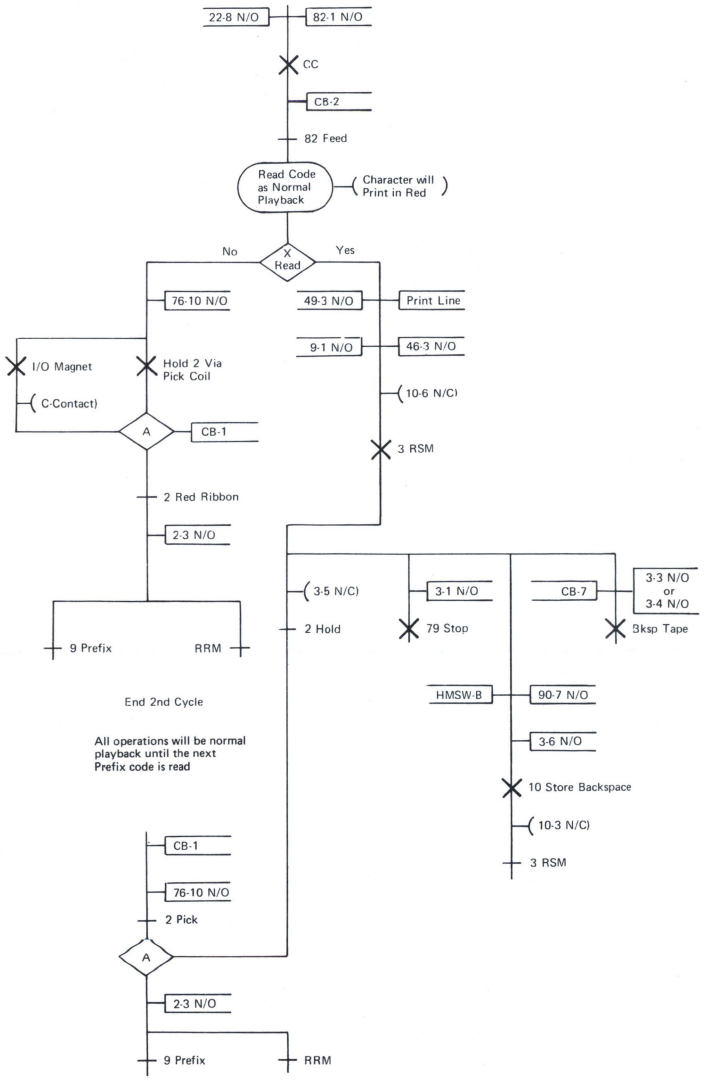
CHARACTER



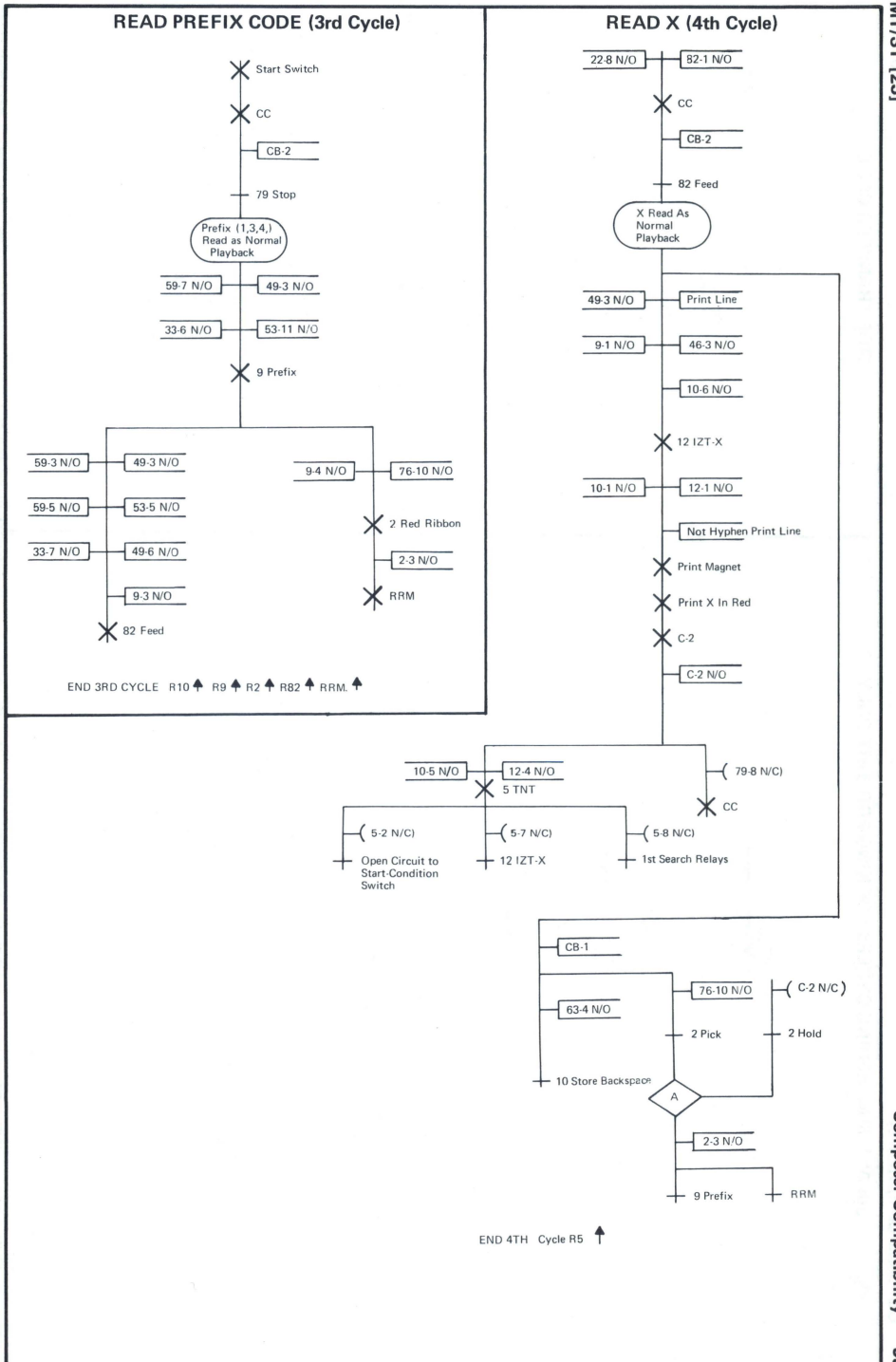
PLAYBACK – GRAPHICS MODE READ PREFIX CODE (1st CYCLE)



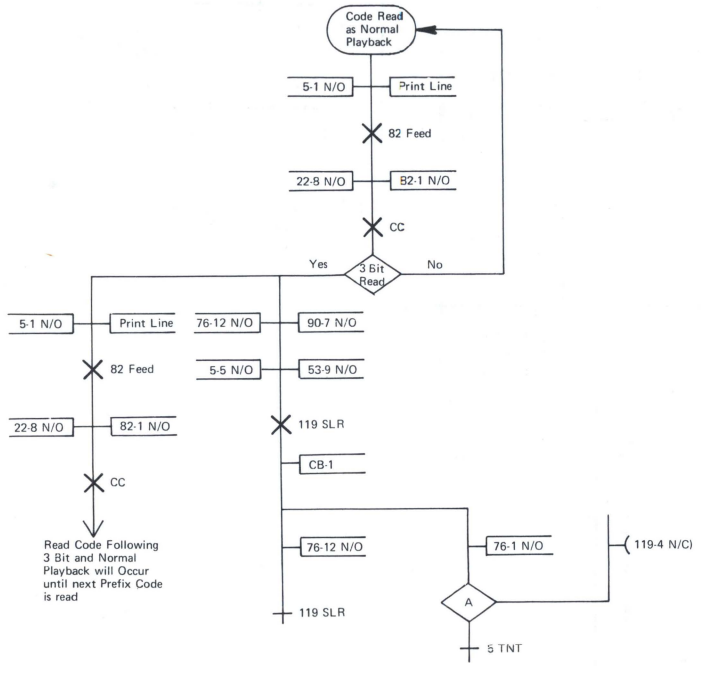
READ CODE FOLLOWING PREFIX CODE (2nd CYCLE)



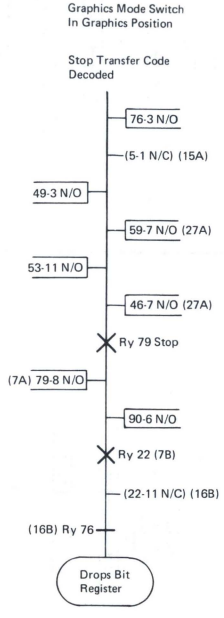
END 2nd CYCLE R10 ↑ R79 ↑ Tape has backstepped and stopped over the Prefix Code


READ PREFIX CODE (3rd Cycle)
Start Switch
CC
CB-2
79 Stop
Prefix (1,3,4,) Read as Normal Playback
59-7 N/O
49-3 N/O
33-6 N/O
53-11 N/O
9 Prefix
59-3 N/O
49-3 N/O
59-5 N/O
53-5 N/O
33-7 N/O
49-6 N/O
9-3 N/O
82 Feed
9-4 N/O
76-10 N/O
2 Red Ribbon
2-3 N/O
RRM
END 3RD CYCLE R10 R9 R2 R82 RRM
READ X (4th Cycle)
22-8 N/O
82-1 N/O
CC
CB-2
82 Feed
X Read As Normal Playback
49-3 N/O
Print Line
9-1 N/O
46-3 N/O
10-6 N/O
12 IZT-X
10-1 N/O
12-1 N/O
Not Hyphen Print Line
Print Magnet
Print X In Red
C-2
C-2 N/O
10-5 N/O
12-4 N/O
5 TNT
79-8 N/C)
CC
5-2 N/C)
Open Circuit to Start-Condition Switch
5-7 N/C)
12 IZT-X
5-8 N/C)
1st Search Relays
CB-1
76-10 N/O
C-2 N/C)
63-4 N/O
2 Pick
2 Hold
10 Store Backspace
A
2-3 N/O
9 Prefix
RRM
END 4TH Cycle R5

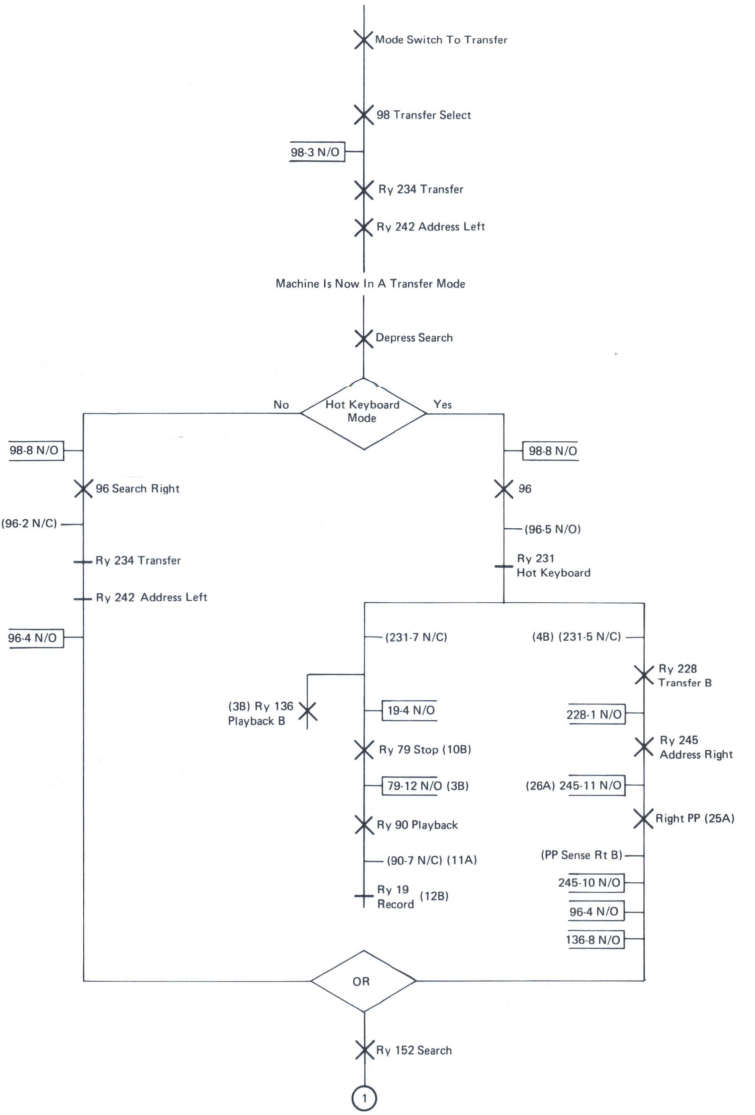
5th AND SUCCEEDING CYCLES LOOKING FOR 3 BIT ONLY



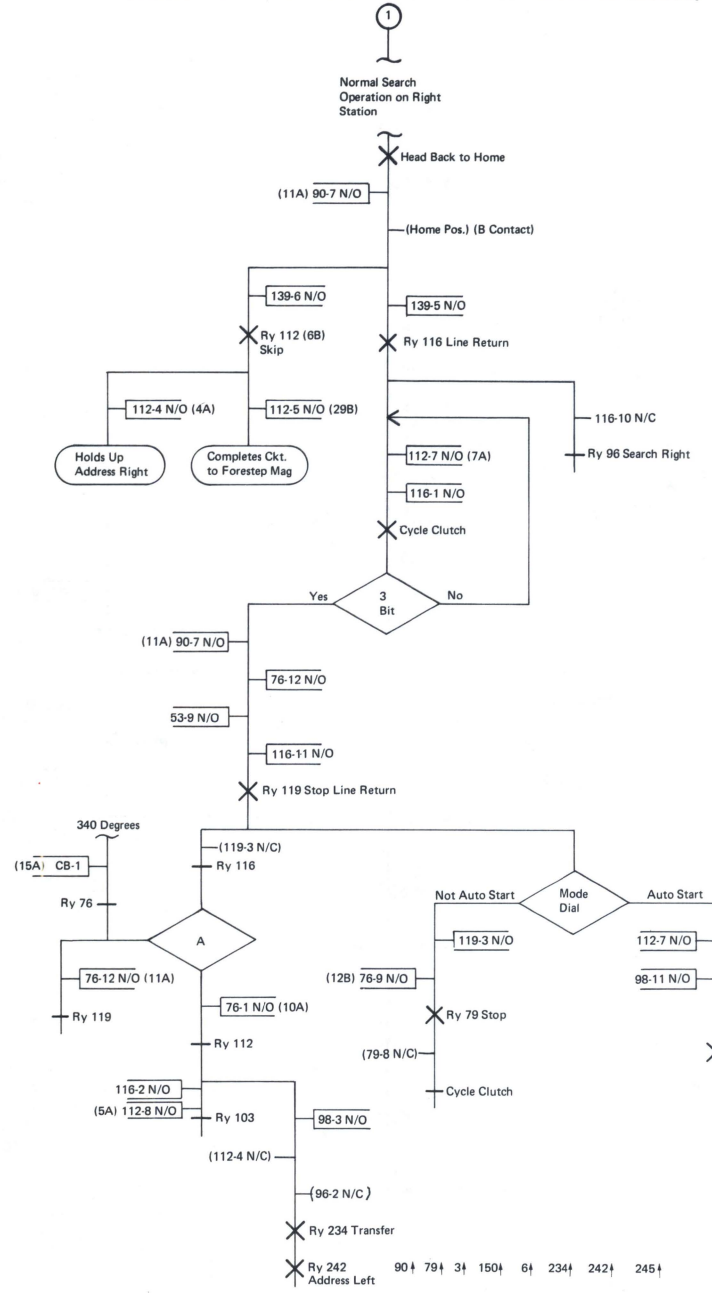
STOP TRANSFER CODE



SEARCH RIGHT STATION IN TRANSFER FEATURE



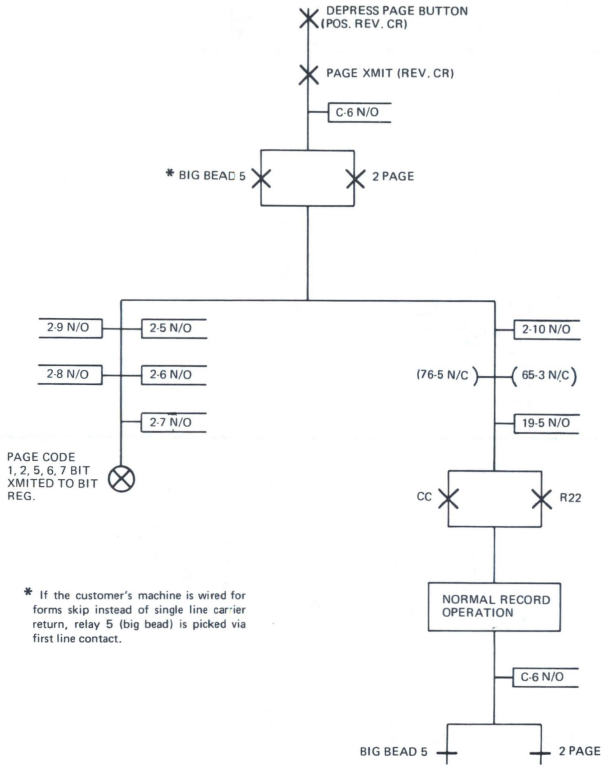
SEARCH RIGHT STATION IN TRANSFER FEATURE (Cont'd)



If a reference code is transferred (or skipped), the counter will be advanced one position to maintain the counter-to-tape orientation. This is accomplished by picking relay 95 when a search bit is recognized (via MP-6 and the read trigger) and holding 95 until the counter is advanced (via 167-1 NC).

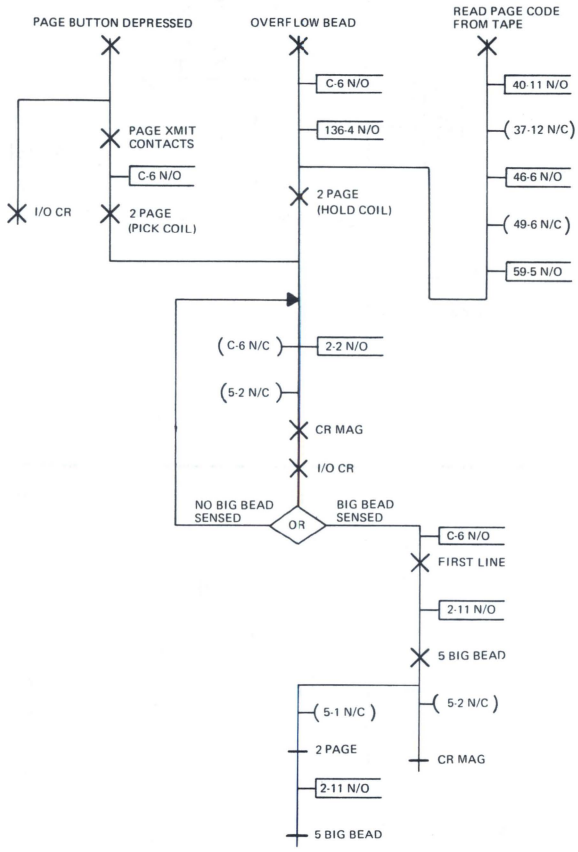
After the 15 search bits are transferred, the first check bit (7-bit) will be transferred. At this time, relay 170 will pick (via 76-7 NO, 95-2 NO, and 40-11 NO). Relay 170 will, in turn, pick 167, the counter will be advanced, and 95 will drop out (via 167-1 NC).

RECORD PAGE CODE

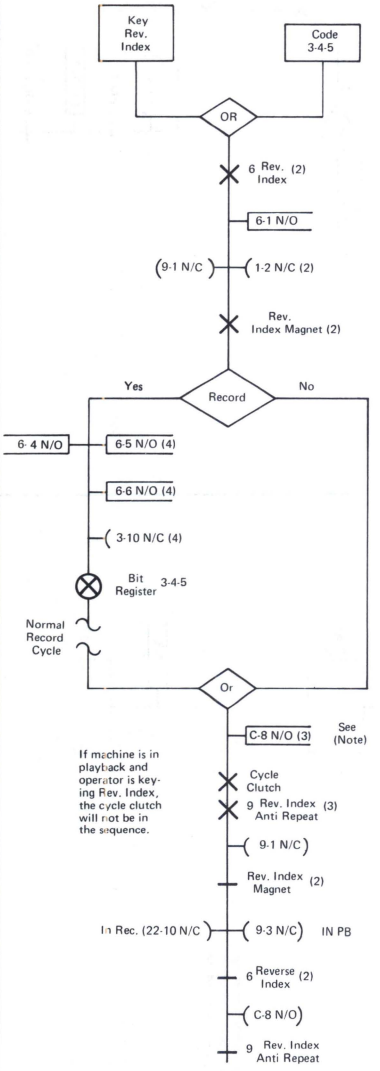


* If the customer's machine is wired for forms skip instead of single line carrier return, relay 5 (big bead) is picked via first line contact.

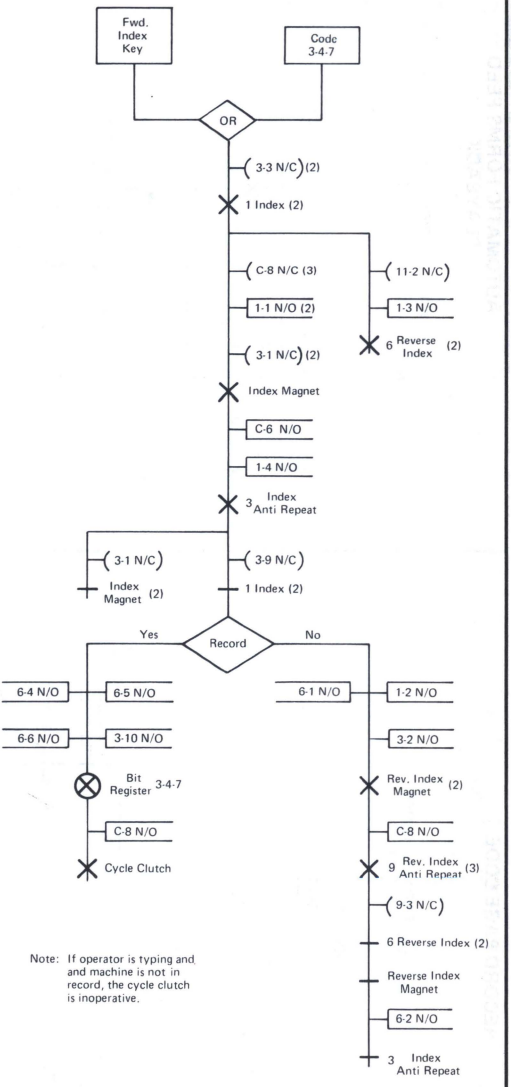
AUTOMATIC FORMS FEED PLAYBACK



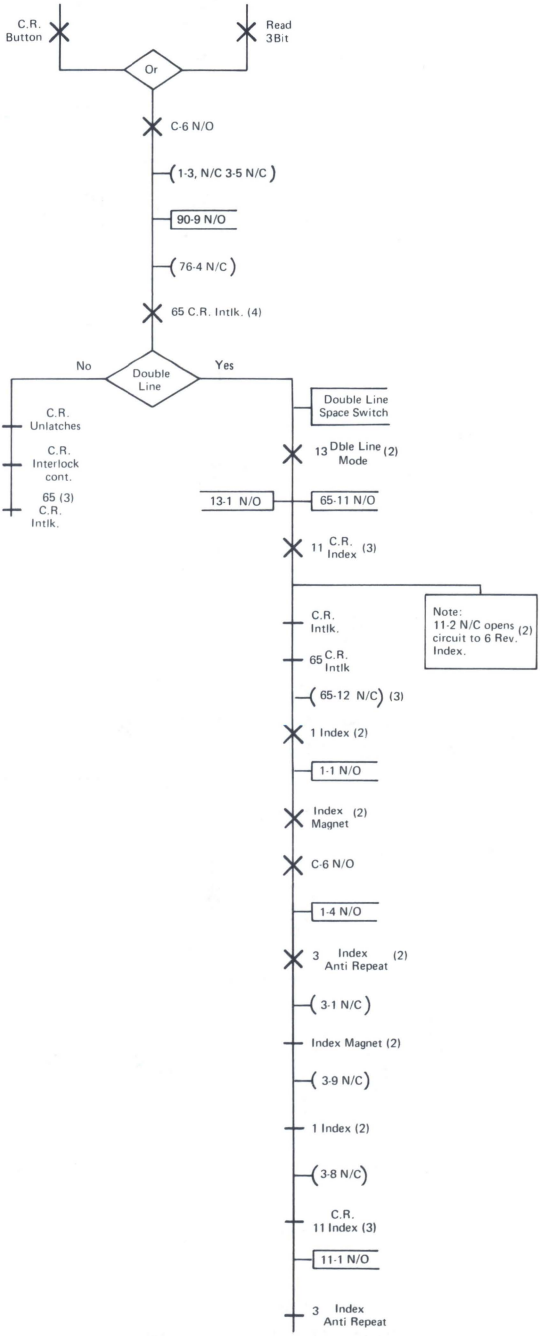
REVERSE INDEX



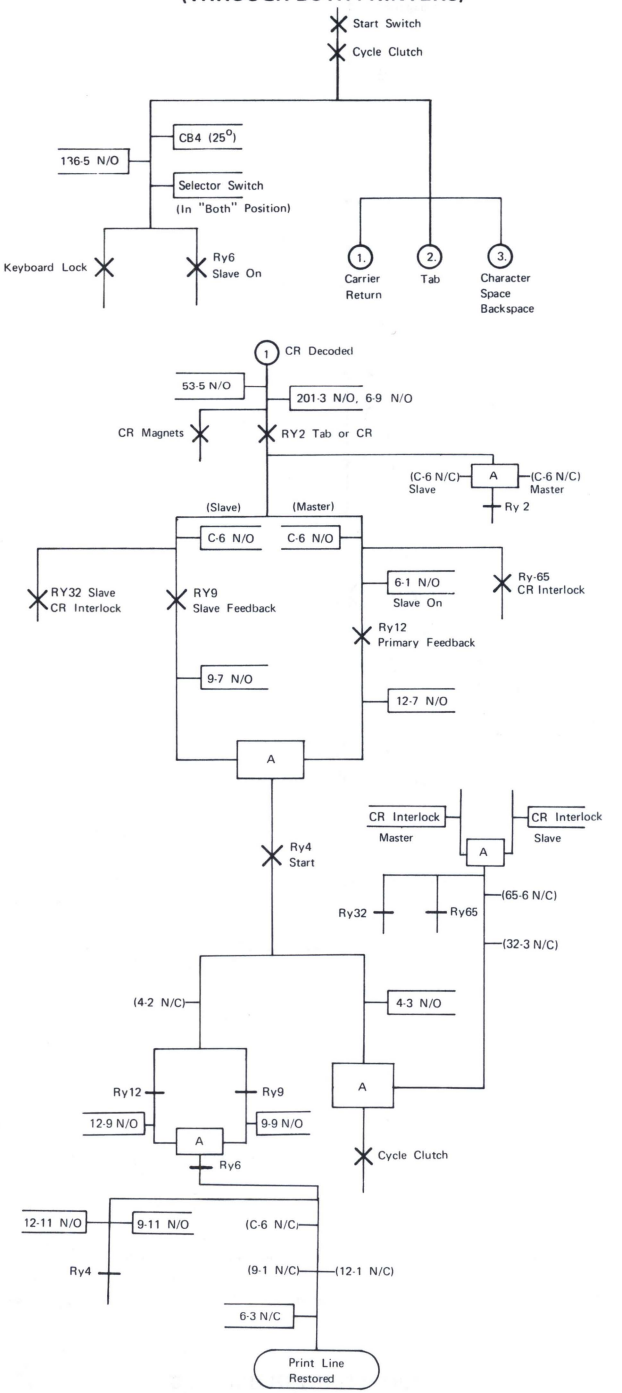
FORWARD INDEX



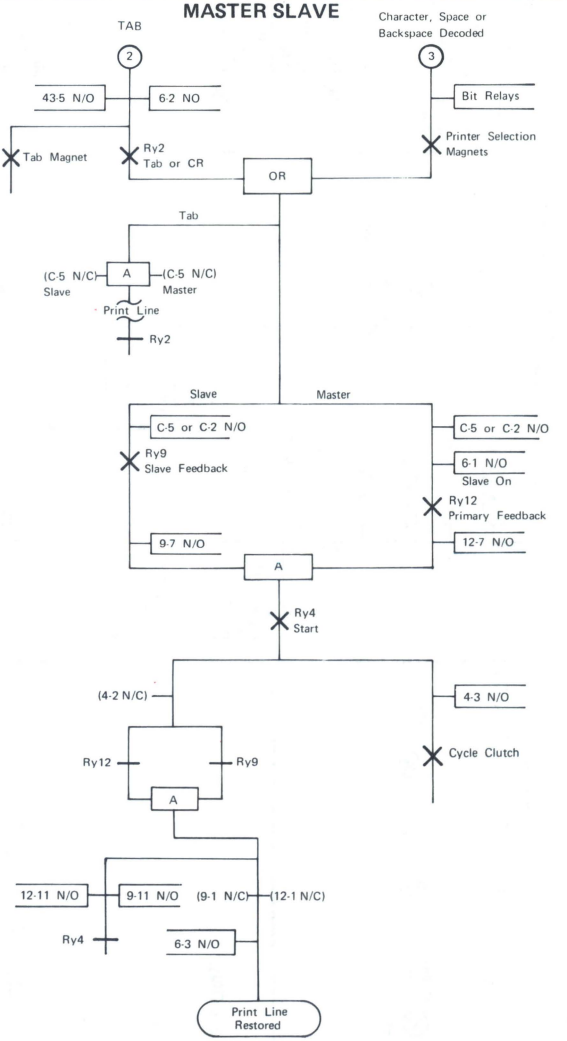
CARRIER RETURN INDEX



MASTER SLAVE PLAYBACK (THROUGH BOTH PRINTERS)

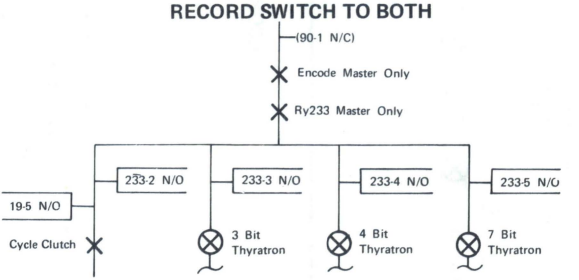


MASTER SLAVE



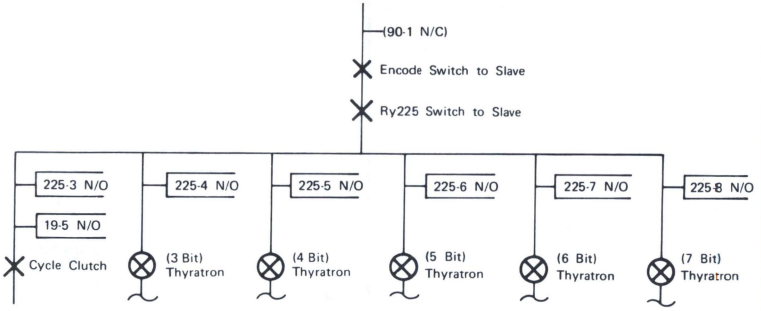
MASTER SLAVE
CODE CONTROL FEATURE

RECORD SWITCH TO BOTH



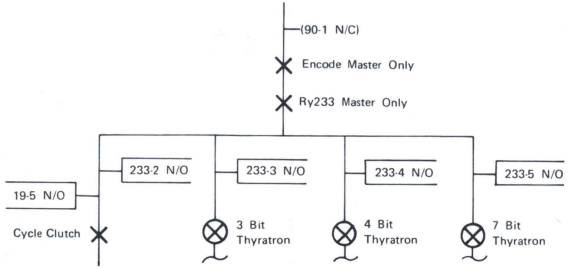
NORMAL RECORD OPERATION

RECORD SWITCH TO SLAVE



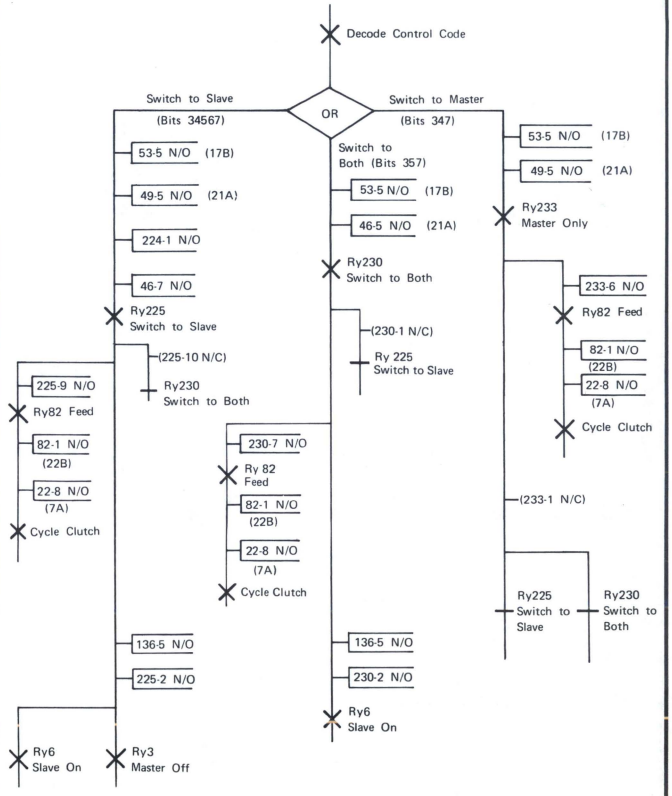
NORMAL RECORD OPERATION

RECORD MASTER ONLY

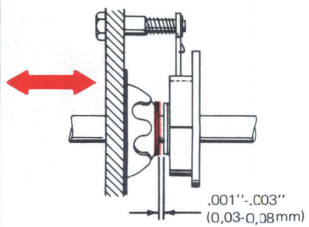


NORMAL RECORD OPERATION

CODE CONTROL FEATURE PLAYBACK

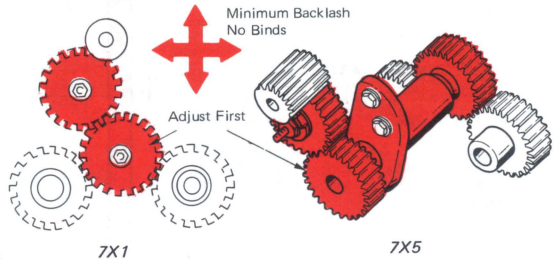


1 Cycle Shaft End Play (23-11)



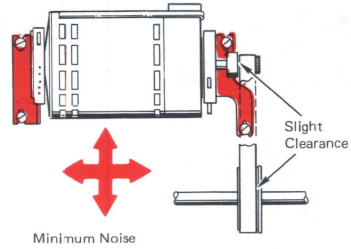
6

2 Idler Gears (23-54)

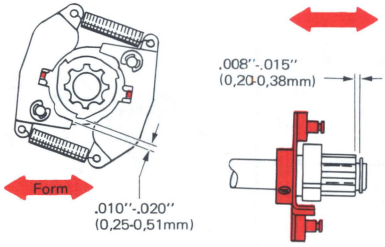


13, 91

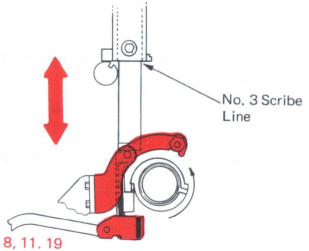
3 Motor And Drive Belt (11-68)



4 Motor Clutch (11-43)

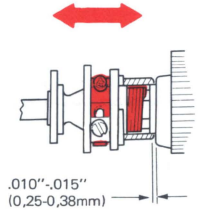


5 Cycle Clutch Latch Bracket (21-181)



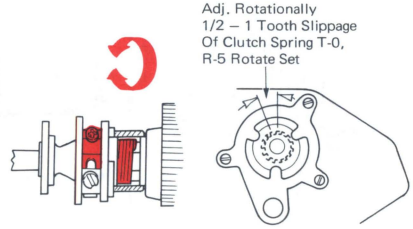
7, 8, 11, 19

6 Cycle Clutch (23-126)



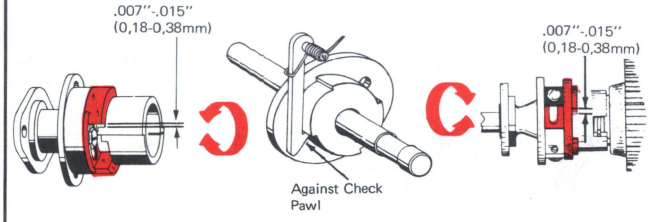
7, 8

7 Cycle Clutch Drive (23-126)

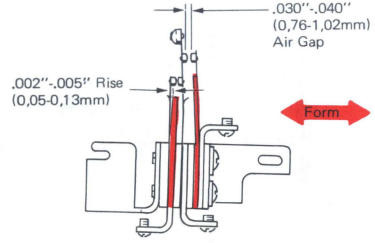


8

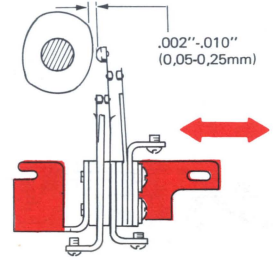
8 Cycle Clutch Overthrow Stop (23-44)



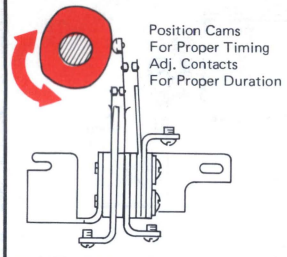
9 Print Feedback Contacts (C1 & C2) (27-100)



10 Contact Mounting Bracket (27-97)



11 C1 & C2 Cams (23-18)

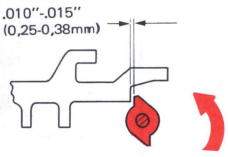


12 Timing Charts C1 & C2

CAM CHART		
Contact	N/O Duration	Color
C1	45°	Blue
C1	65°	Black
C2	90°	White
C2	110°	Orange

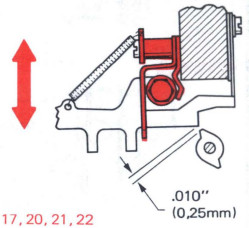
TIMING CHART (C-1 & C-2)				
	C-1 N/O		C-2 N/C	
Machine	Make	Break	Break	Make
731	85° ± 3	130° ± 3	20° ± 3	120° ± 3
735	85° ± 3	130° ± 3	20° ± 3	120° ± 3
775	85° ± 3	130° ± 3	20° ± 3	120° ± 3
(MT/ST)				

13 Filter Shaft (21-12)



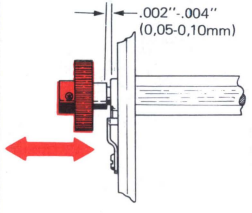
46, 144, 158, 176

14 Rear Interposer Guide Comb (21-200)

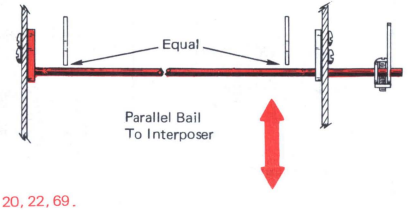


17, 20, 21, 22

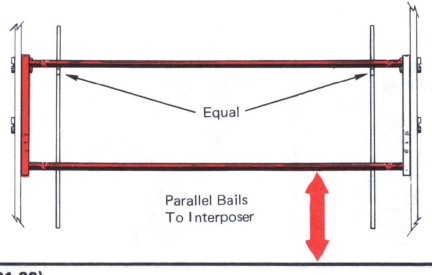
15 Filter Shaft Gear (21-08)



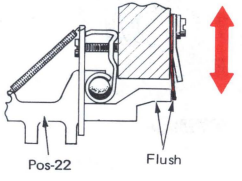
16 Selector Bail Plate (21-02)



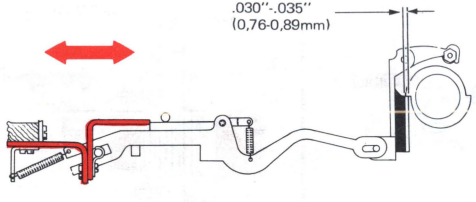
20, 22, 69.



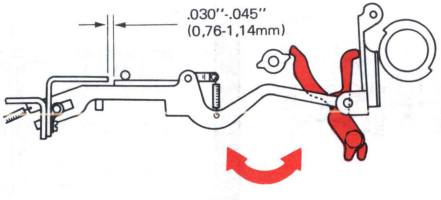
17 Latch Springs (Preliminary) (21-208)



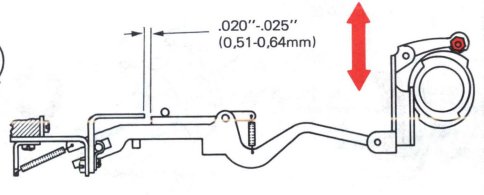
18 Keeper Bracket (21-97)



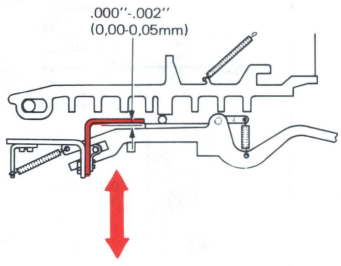
19 Cycle Clutch Restoring (21-92)



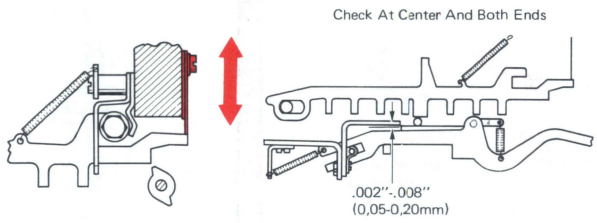
(21-40)



20 Cycle Clutch Pawl Keeper (21-96)

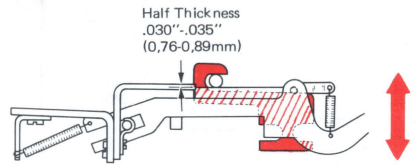


21 Latch Springs (Final) (21-208)



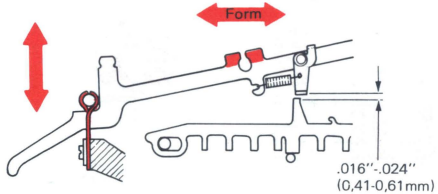
20, 22, 23

22 Cycle Bail Upstop (21-76)



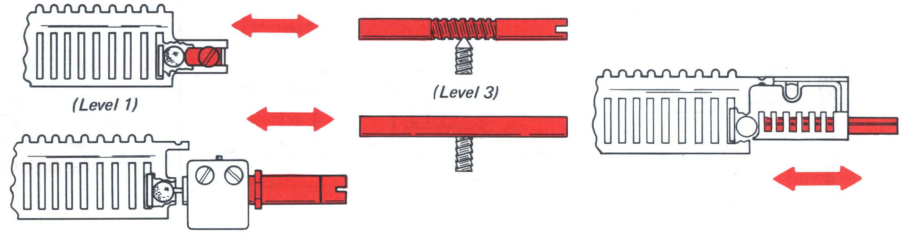
20

23 Front Keylever Guide Comb (21-256)

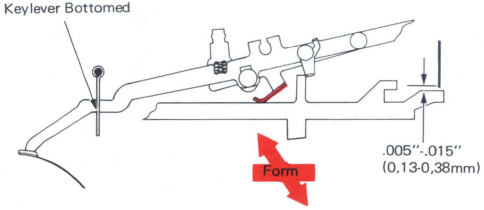


16, 184

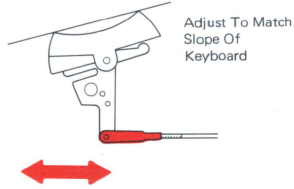
24 Compensator Tube (21-201)



25 Repeat Keylever (21-250)

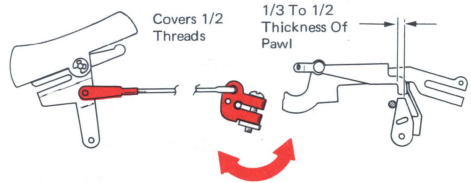


26 On/Off Link (11-62)

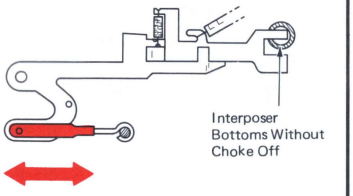


27

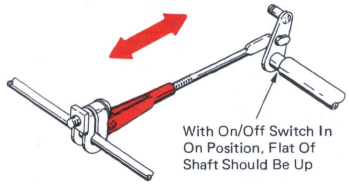
27 Lockout Bail Bellcrank Link (09-27)



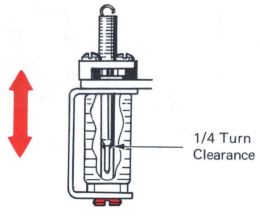
28 Keyboard Lock Bellcrank Link (09-112)



29 Operational Lockout Link (09-104)

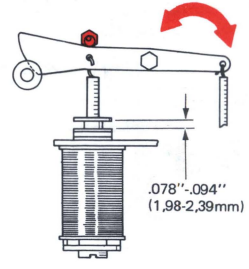


30 Solenoid Adjustment (28-284)

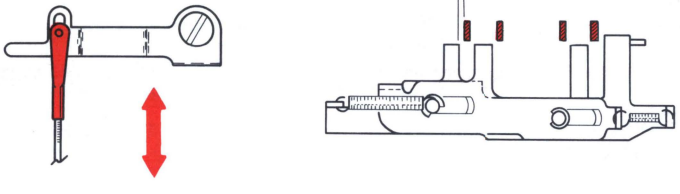


32

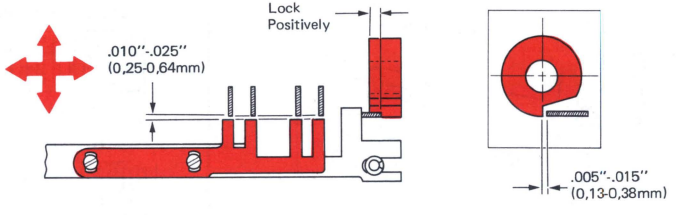
31 Eccentric Stop (10-14)



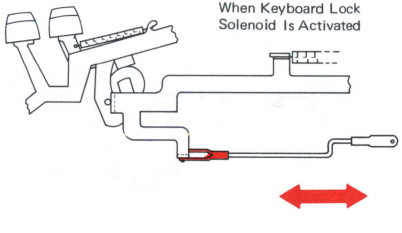
32 Keyboard Lock Link (10-27)



33 Spacebar Lock Cam & Lock Comb (Solenoid Operated) (10-87)

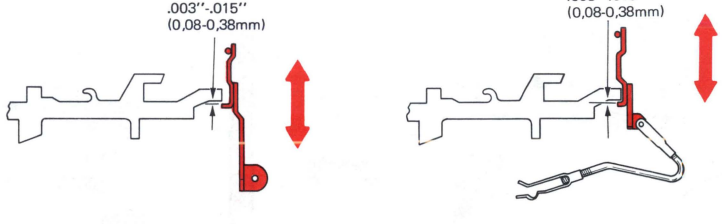


34 Shift Lock Link (16-09)



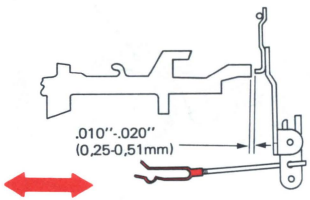
44

35 Keyboard Interposer Link (10-03)

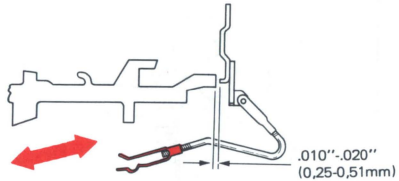


(Level 1) *(Level 2)*

36 Interposer Lock Link (10-04)

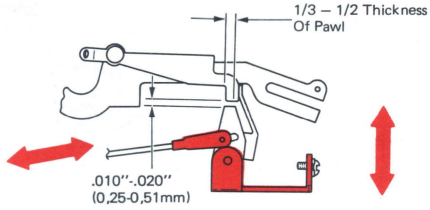


(Level 1)



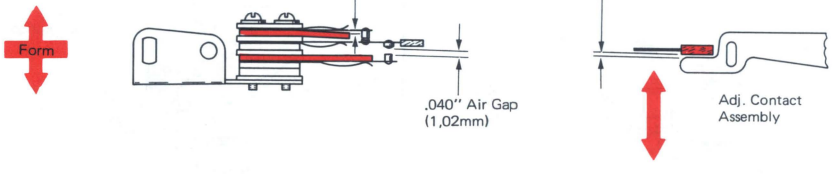
(Level 2)

37 Cycle Clutch Pawl Stop Link (10-57)

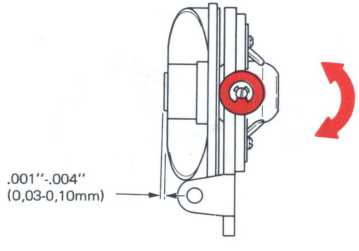


Solenoid Operated

38 Keyboard Mode Contacts (27-200)

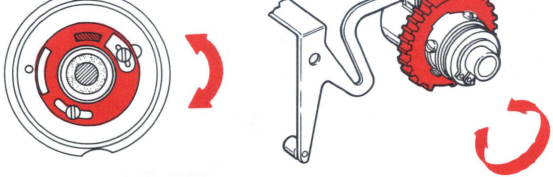


39 Shift Cam Backup Roller (16-46)



90

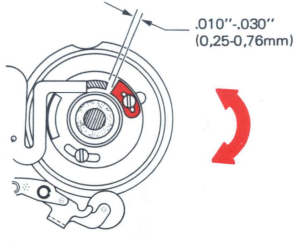
40 Shift Clutch Spring (16-65)



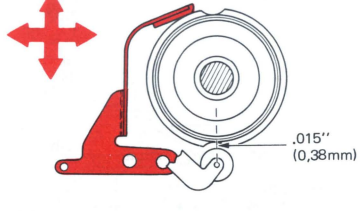
(Level 1)

(Level 2)

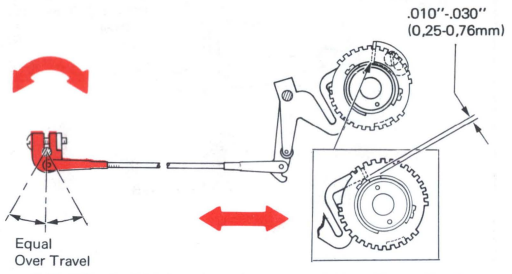
41 Shift Overthrow Stop (16-67)



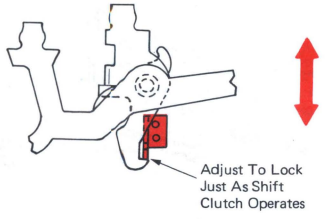
42 Shift Cam Brake (16-39)



43 Shift Release (16-08)

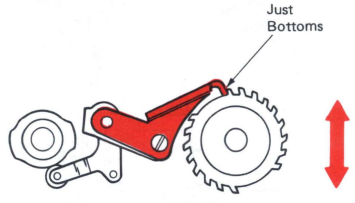


44 Shift Lock (16-24)



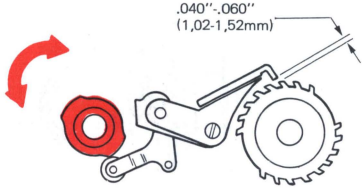
34

45 Shift Interlock (16-154)

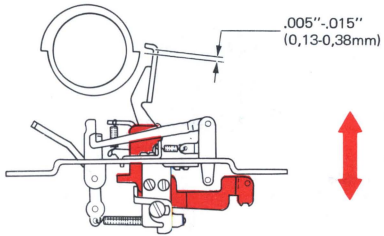


15"

46 Shift Interlock Cam (16-153)

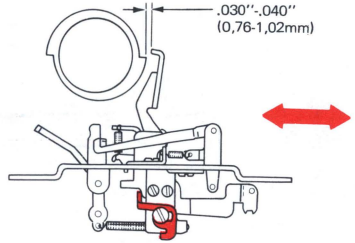


47 Cycle Clutch Interlock Arm Plate (21-159)



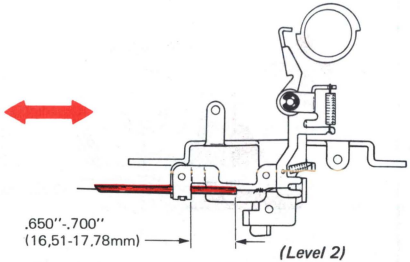
(Level 2)

48 Cycle Clutch Interlock Stop (21-164)

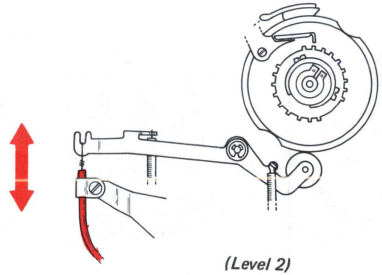


(Level 2)

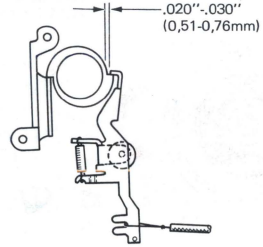
49 Cycle Clutch Interlock Cable Sheath (16-147)



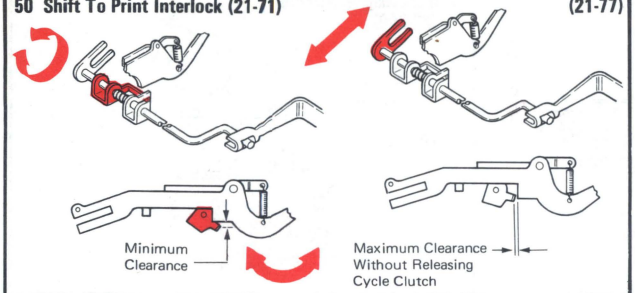
(Level 2)



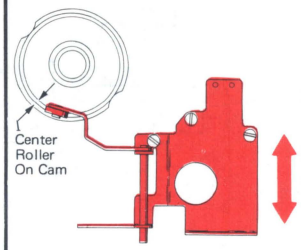
(Level 2)



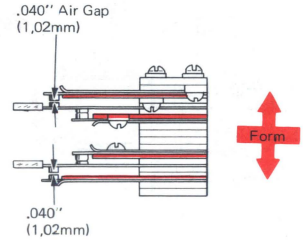
50 Shift To Print Interlock (21-71) (21-77)



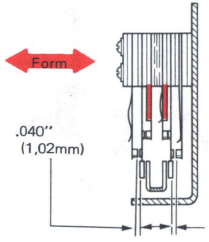
51 Contact Mounting Plate (27-130)



52 Shift Mode & C3-C4 (Preliminary) (27-121)



53 C3 & C4 Contacts (27-120)

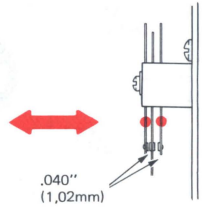


Shift	N/O Make	N/O Break
C3 & C4	35° ± 5	145° ± 5

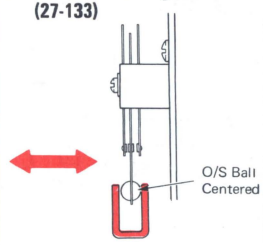
NOTE: Each shift operation is 180°

Transfer Time Should Be 3 Deg. To 9 Deg. On The Right Side Of The Cam

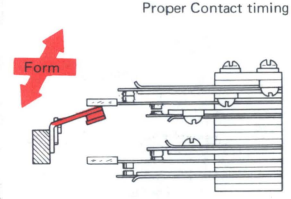
54 Transmitting Contacts (27-126)



55 Contact Actuating Arm (27-133)



56 Mode Contact Actuating Arm (16-229)



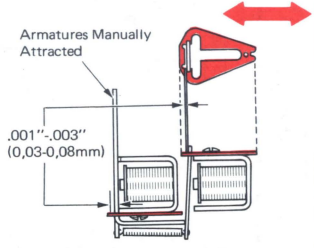
(Top View)

57 Contact Timing (Mode)

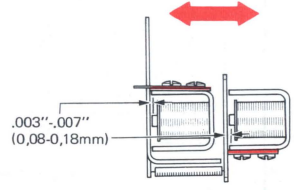
	N/O Make	N/O Break	
With Level 1 Character Interrupter	80° ± 10	100° ± 10	Mode 1
	130° ± 10	50° ± 10	Mode 2
With Level 2 Shift Interlock	100° ± 10	120° ± 10	Mode 1
	130° ± 10	87° ± 10	Mode 2

NOTE: Each Shift Operated Is 180 Deg.

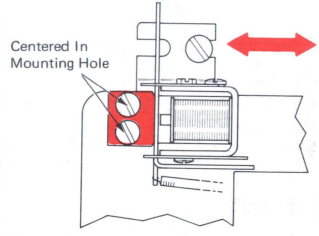
58 Hinge Plates (28-193)



59 Armature Stops (28-152)

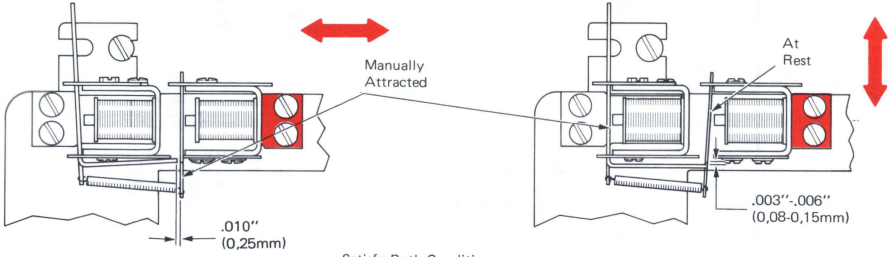


60 Upper Case Magnet (28-181)



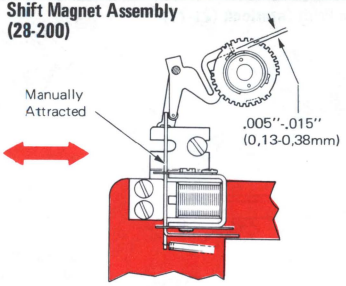
61, 62, 63

61 Lower Case Magnet (28-182)

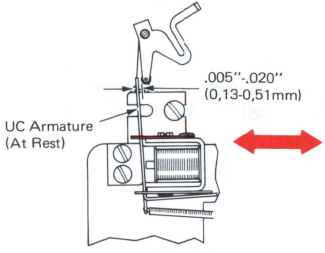


Satisfy Both Conditions

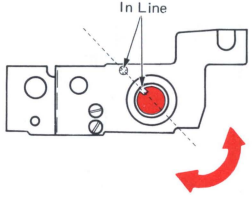
62 Shift Magnet Assembly (28-200)



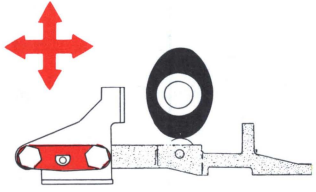
63 U.C. Armature Backstop (28-192)



64 Print Shaft Timing (Preliminary) (02-38)

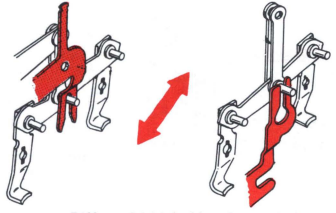


65 Latch Bail Shaft (23-167)



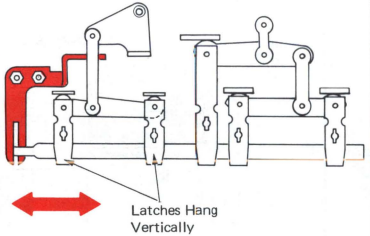
Bail Parallel To Cycle Shaft

66 Differential Guides (23-172)

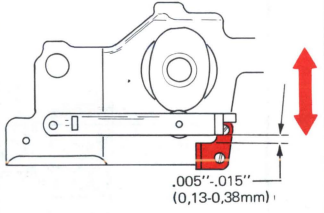


Differential Links Must Be Vertical

67 Positive Bail Guide (23-77)

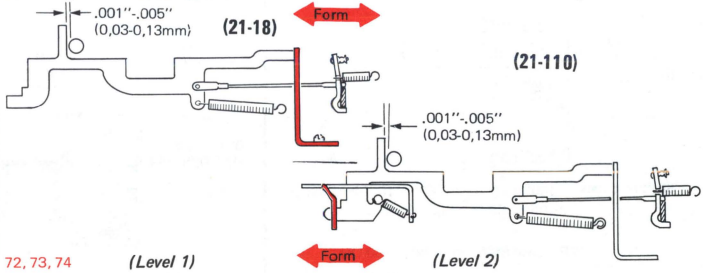


68 Selector Bail Overthrow Stop (23-14)



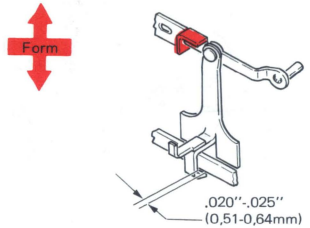
(Level 1 Only)

69 Interposer Latch Stop

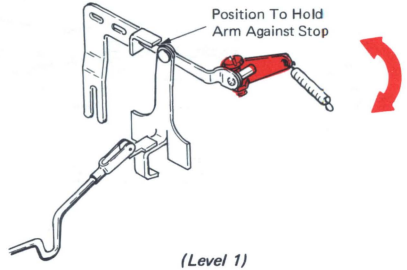


72, 73, 74 *(Level 1)* *(Level 2)*

70 Check Latch Upstop (23-173)

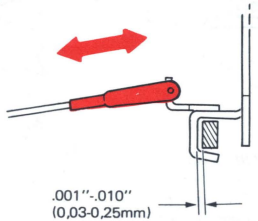


71 Check Latch Return Arm (23-93)

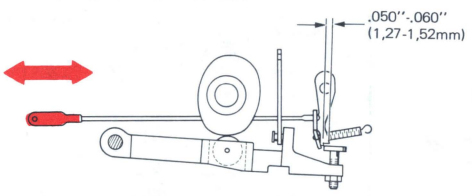


(Level 1)

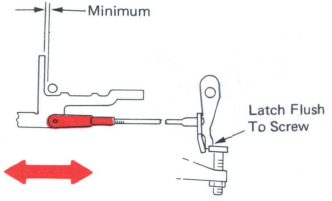
72 Check Latch Link (21-14)



73 Negative 5 Latch Link (21-16)

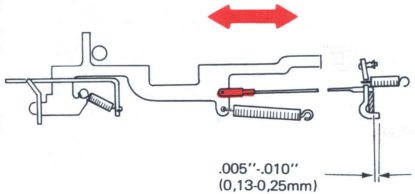


(Level 1)

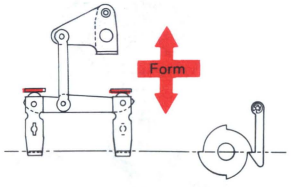


(Level 2)

74 Selector Latch Links (21-16)

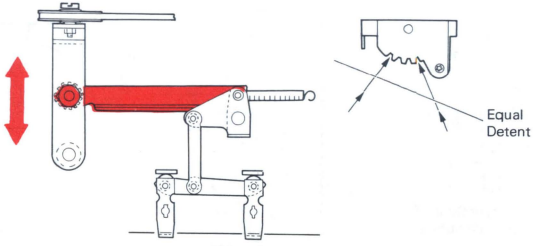


75 Tilt Latches (23-118)

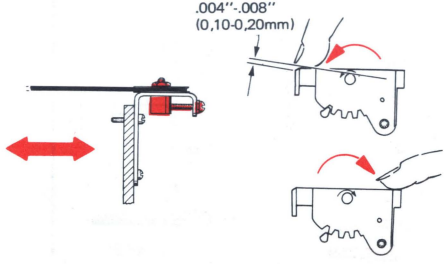


77 Check All Detenting Positions

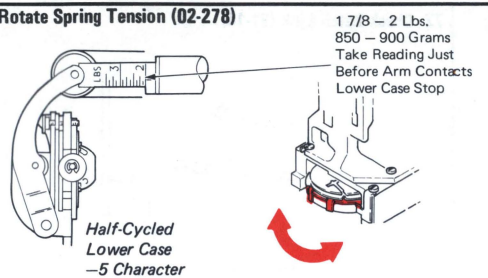
76 Tilt Arm Motion (23-79)



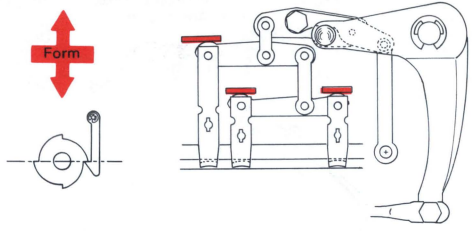
77 Tilt Ring Homing (23-05)



78 Rotate Spring Tension (02-278)

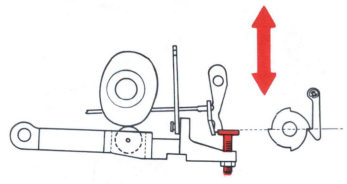


79 Rotate Latches (23-123)



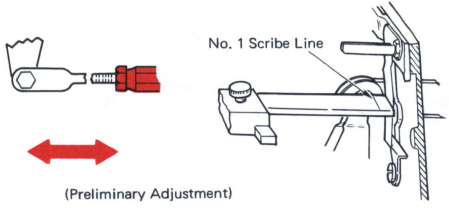
Check All Detenting Positions

80 Negative 5 Latch (23-134)

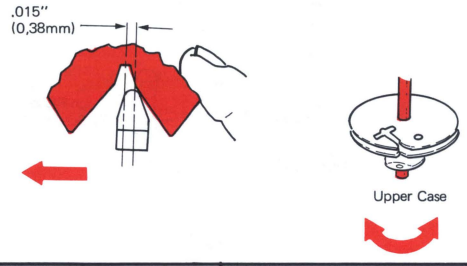


Check All Detenting Positions

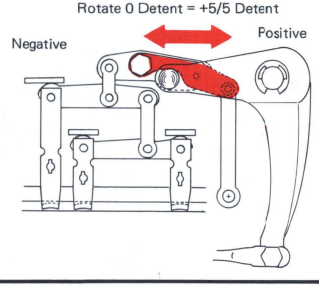
81 Rotate Arm Vertical (23-122)



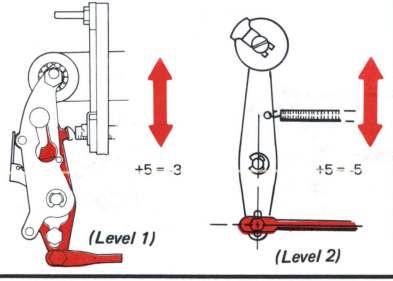
82 Coarse Homing (02-155)



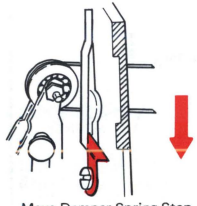
83 Balance Lever (23-120)



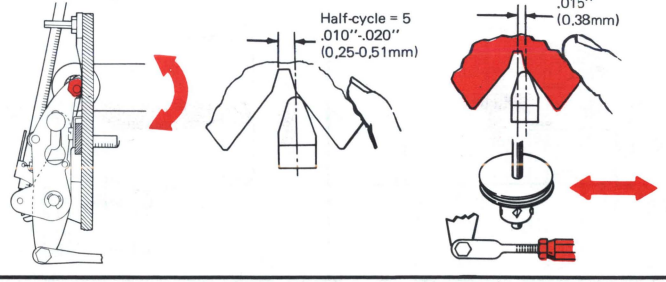
84 Rotate Arm Motion (23-71)



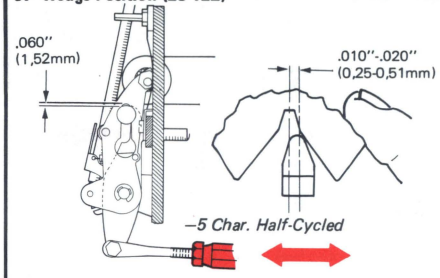
85 Damper Spring (Preliminary)(23-58)



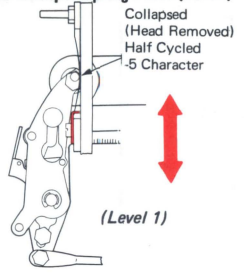
86 Fine Homing (23-49)



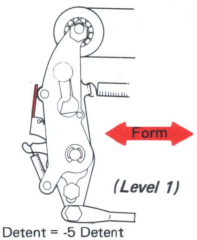
87 Wedge Position (23-122)



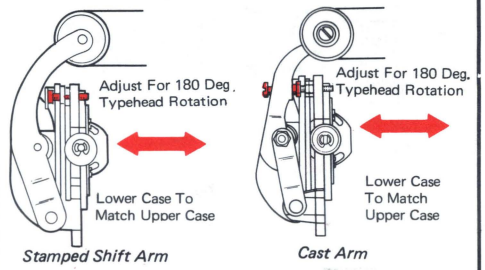
88 Damper Spring Final (23-58)



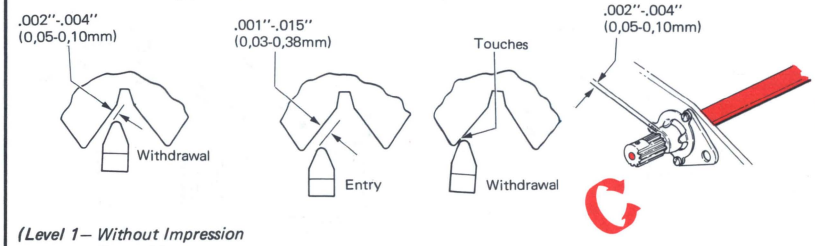
89 Ratio Change (23-45)



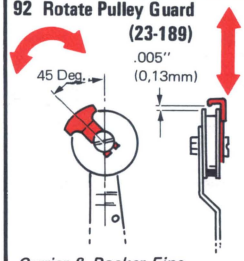
90 Shift Motion (16-49)



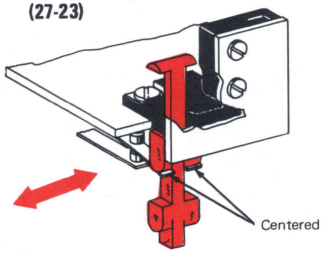
91 Print Shaft Timing (02-38)



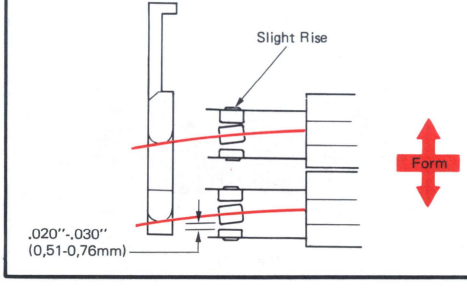
92 Rotate Pulley Guard (23-189)



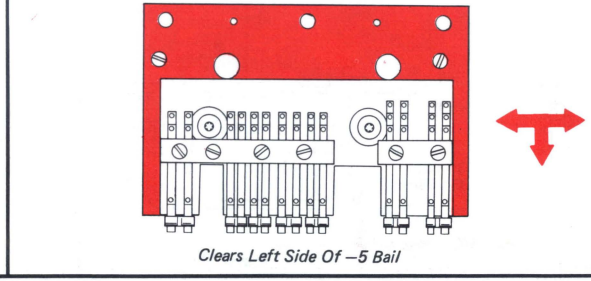
93 Selector Contact Actuator Guide (27-23)



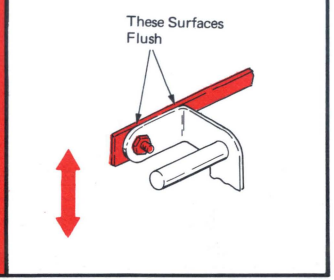
94 Contact Straps (27-12)



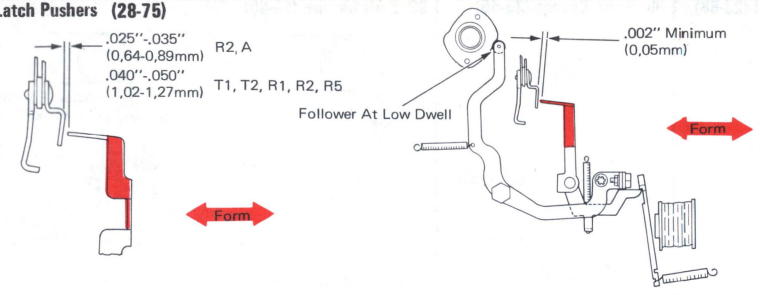
95 Selection Contact Mounting Plate (27-27)



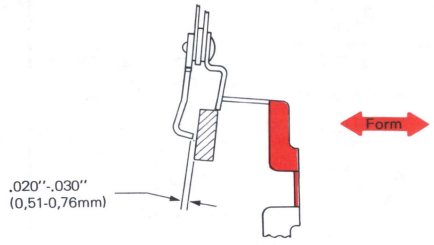
96 Pusher Bail Eccentrics (28-89)



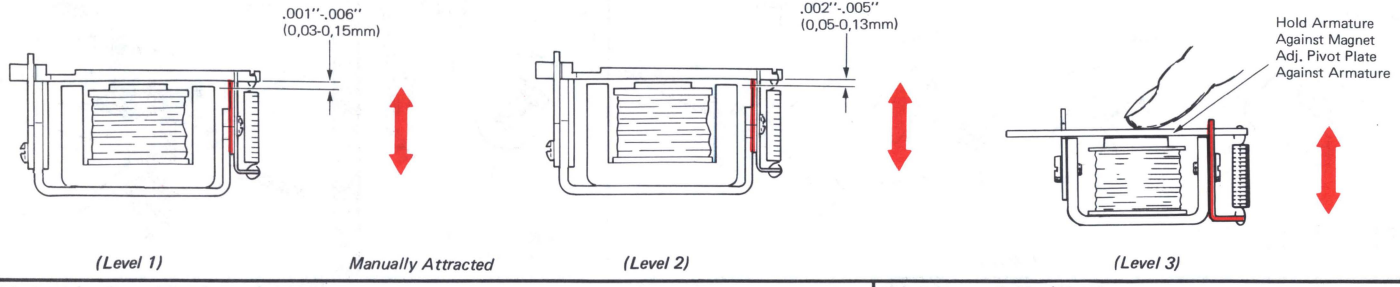
97 Latch Pushers (28-75)



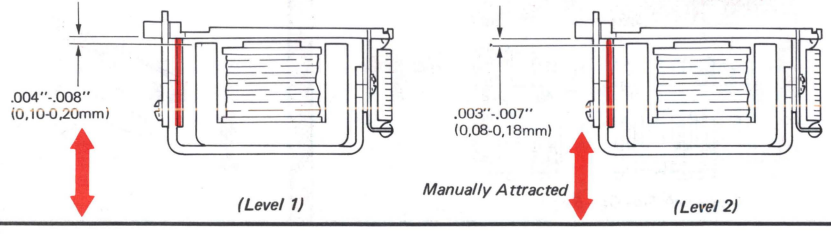
98 Check Latch Pusher (28-76)



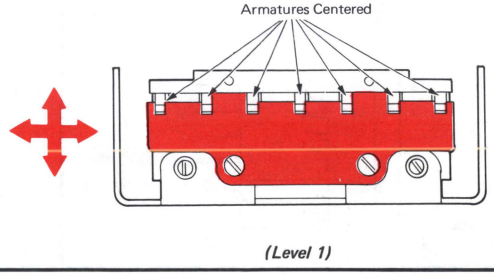
99 Pivot Plate (28-50)



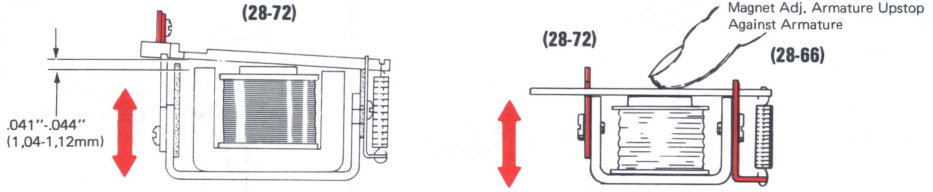
100 Armature Stop (28-44)



101 Armature Guide (28-19)

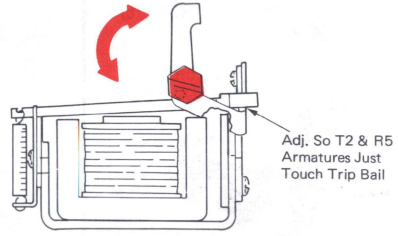


102 Armature Upstop



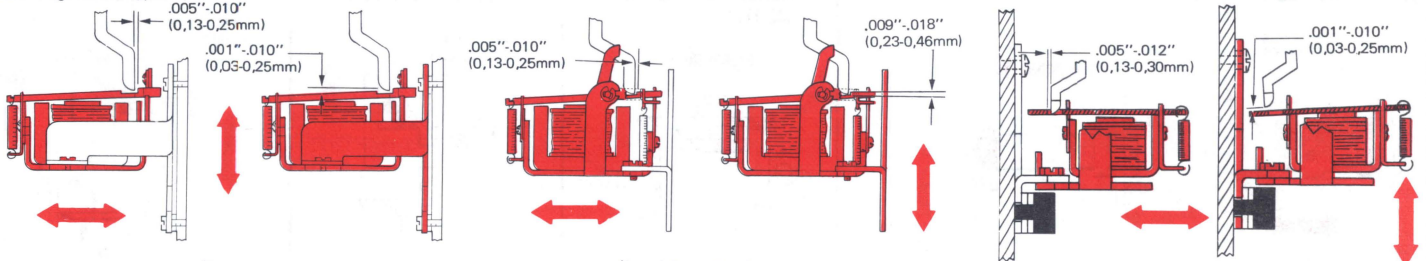
(Level 1 At Rest) *(Level 3)*

103 Pivot Eccentrics (28-69)



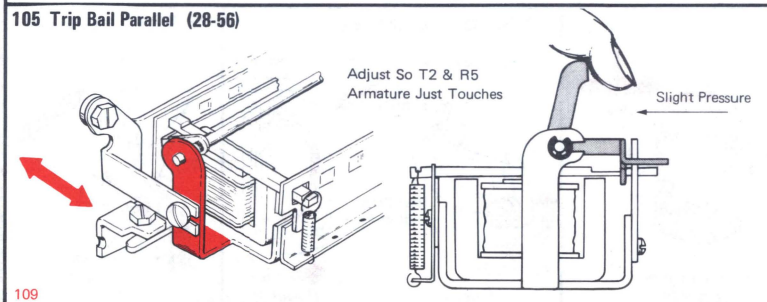
(Level 1 & Level 3 At Rest)

104 Magnet Unit (28-74)

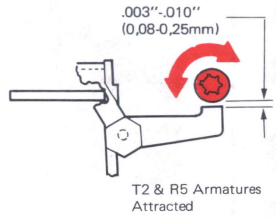


(Level 1 At Rest) *(Level 2 At Rest)* *(Level 3 — Manually Attracted)*

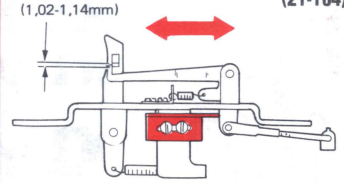
105 Trip Bail Parallel (28-56)



106 Knockoff Eccentrics (28-86)

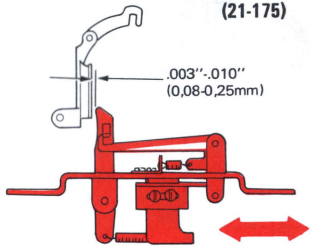


107 Latch Lever Stop (Mechanism Removed) (21-164)



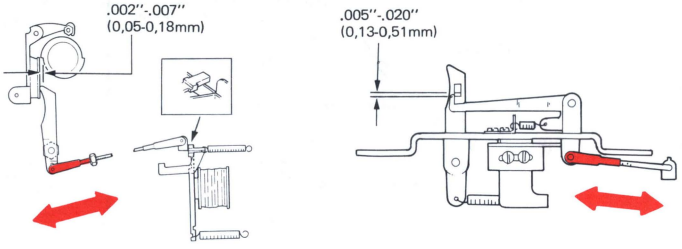
(Level 2)

108 Trip Mechanism Mounting Bracket (21-175)

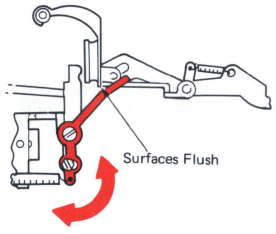


48, 109

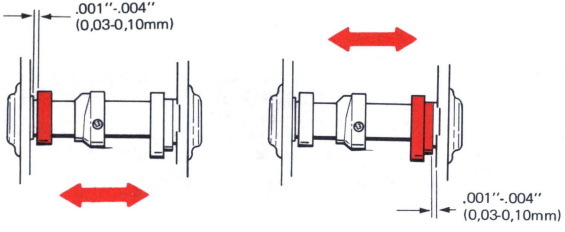
109 Cycle Clutch Trip Link (21-53)



110 Inhibitor (21-125)



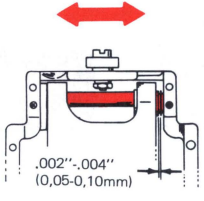
111 Print Sleeve End Play (02-48)



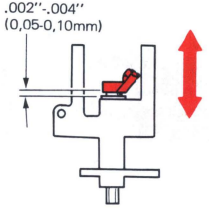
121

(Level 1) *(Level 2)*

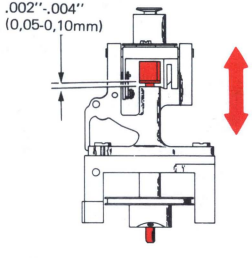
112 Rocker Shaft End Play (02-177)



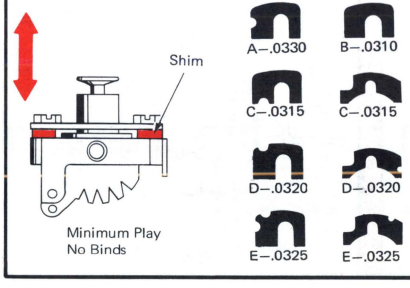
113 Tilt Tube End Play (02-190)



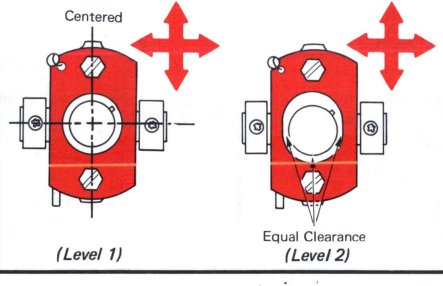
114 Rotate Shaft End Play (02-242)



115 Upper Ball Socket (02-206)

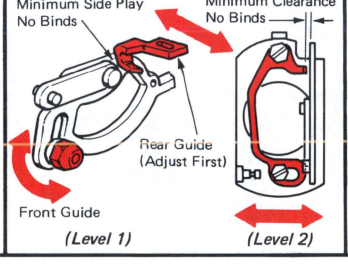


116 Tilt Ring Spacer (02-204)



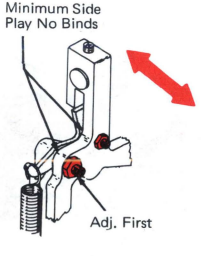
(Level 1) *(Level 2)*

117 Rotate Detent (02-198)



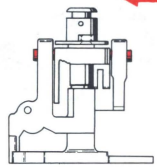
(Level 1) *(Level 2)*

118 Tilt Detent (02-213)

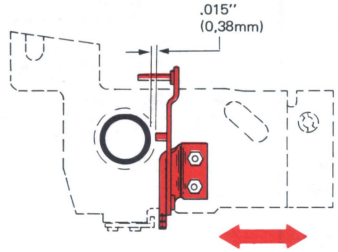


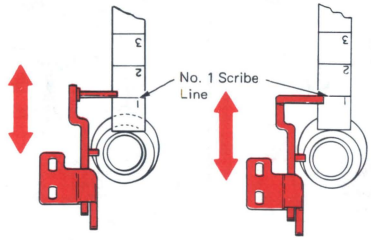
119 Tilt Ring Pivot Pins (02-187)

No End Play
No Binds
Centered

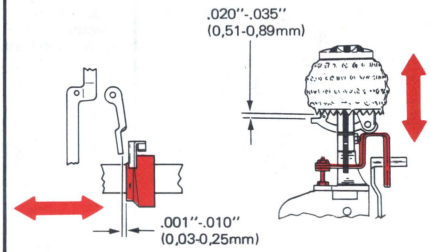


120 Detent Cam Follower Bracket (02-30)

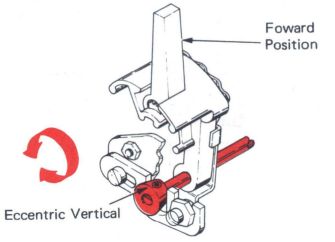




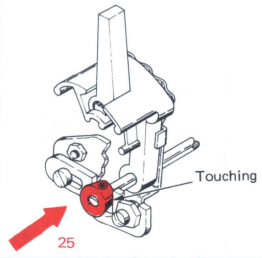
121 Detent Cam (02-247)



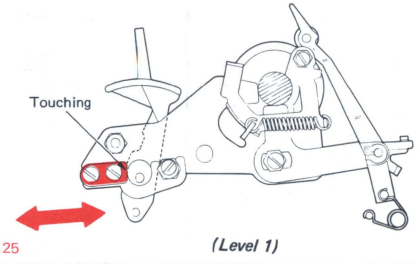
122 Copy Control Lever Shaft (22-12)

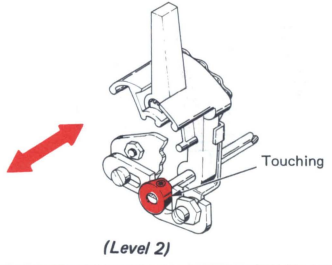


123 Copy Control Eccentric (22-12)

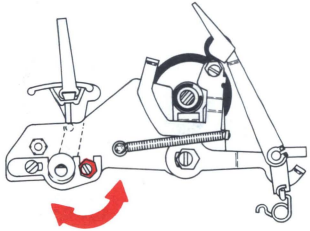


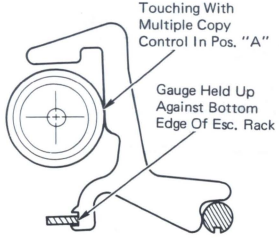
124 Platen Adjusting Plates (22-08)



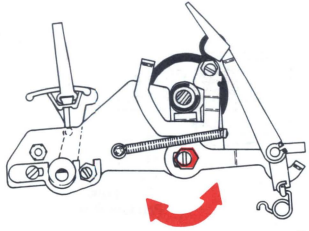


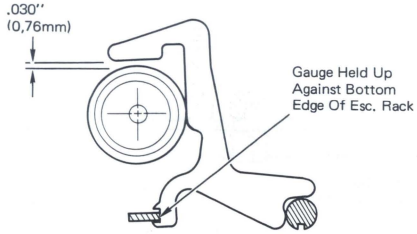
125 Platen Front-To-Rear (22-05)



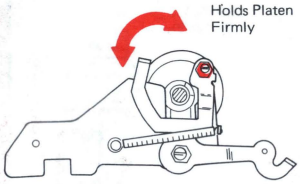


126 Platen Height (22-27)



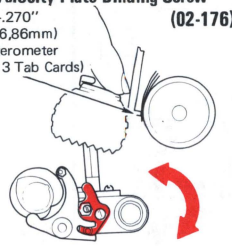


127 Platen Latches (22-10)



128 Velocity Plate Binding Screw (02-176)

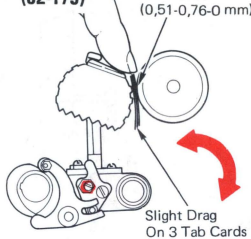
.260"-.270"
(6,60-6,86mm)
(Hooverometer
+2 Or 3 Tab Cards)



129 *Pre-Dual Impression*

129 Velocity Plate Eccentric (02-175)

.020"-.030"
(0,51-0,76-0 mm)



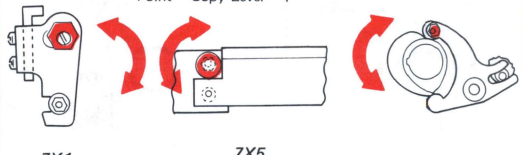
128 *Pre-Dual Impression*

130 Anvil (02-167)

No Period Or Point — Copy Lever —5

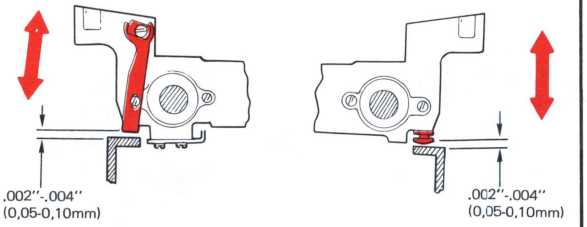
Light Period Or Point — Copy Lever —4

Eccentric Up Before Making Adjustment



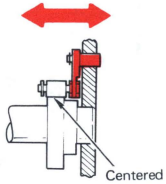
129 *(Level 1)*

131 Carrier Buffers (02-11) (02-47)



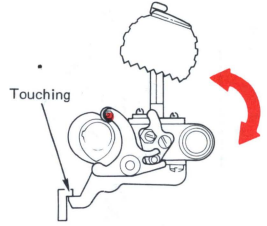
(Level 1 — 7X5)

132 Print Cam Follower Stud (02-23)



(Level 1)

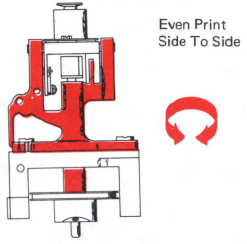
133 Cam Follower Eccentric & Yoke (02-167)



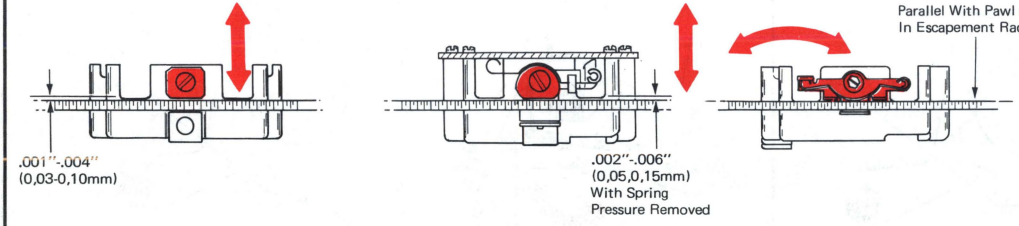
121 *(Level 1)*

134 Yoke Position (02-243)

Even Print Side To Side

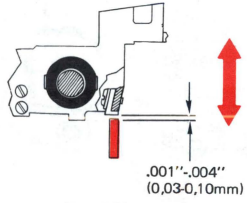


135 Rear Carrier Shoe (02-26) (02-80)



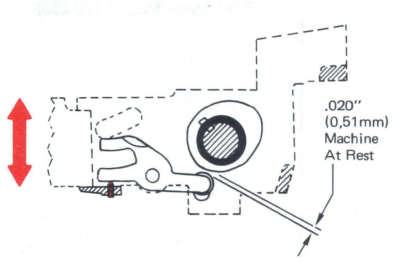
(Level 1) *(Level 2)* *(Level 3)*

136 Carrier Support (02-94)

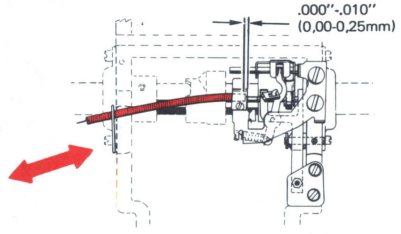


(Level 2)

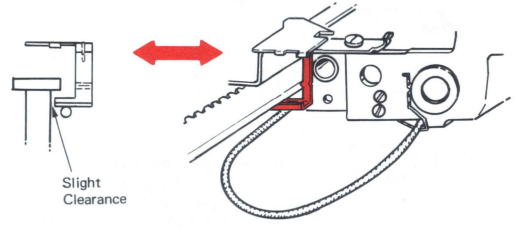
137 Print Cam Follower Stop (02-73)



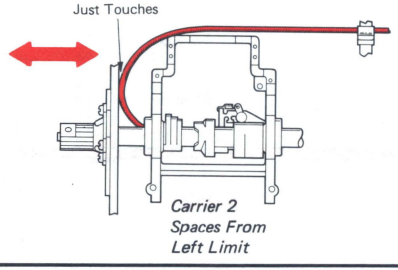
138 Velocity Control Cable (02-84)



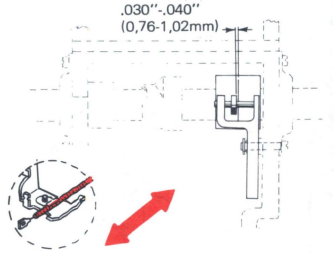
139 Velocity Cable Deflector (18-218)



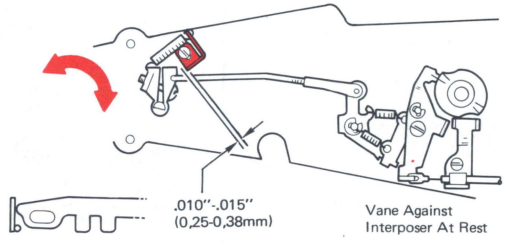
140 Center Cable Clamp (21-311)



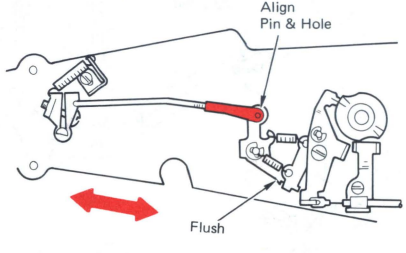
141 Cable Clamp (21-313)



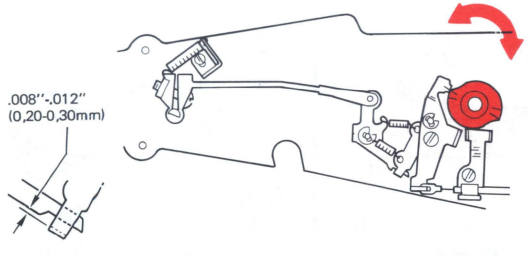
142 Low Velocity Vane Stop (21-361)



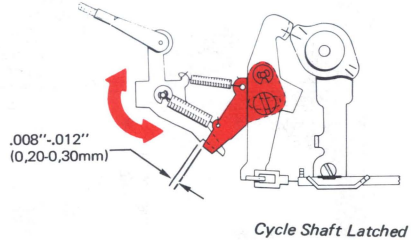
143 Low Velocity Latch Link (21-334)



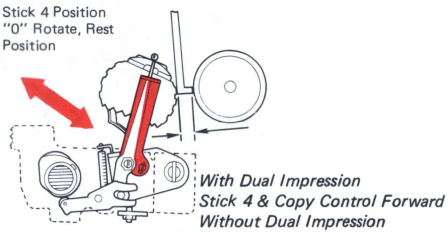
144 Low Velocity Cam (21-316)



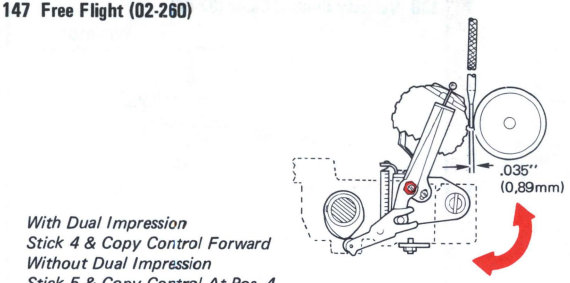
145 Low Velocity Cam Follower Stop (21-329)



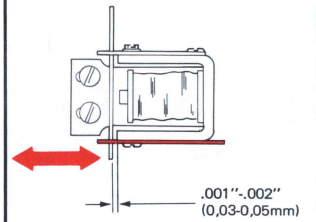
146 Powered Travel (02-259)



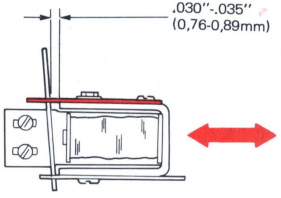
147 Free Flight (02-260)



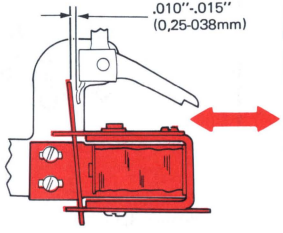
148 Dual Velocity Magnet & No Print Space Magnet (28-269)



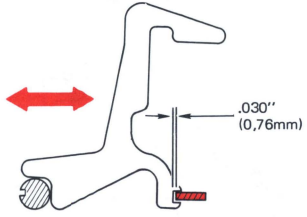
149 Magnet Backstop (28-265)



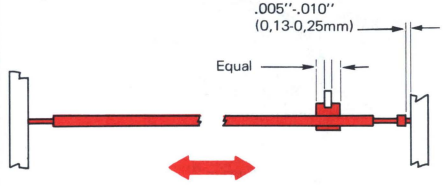
150 Magnet Assembly (28-260)



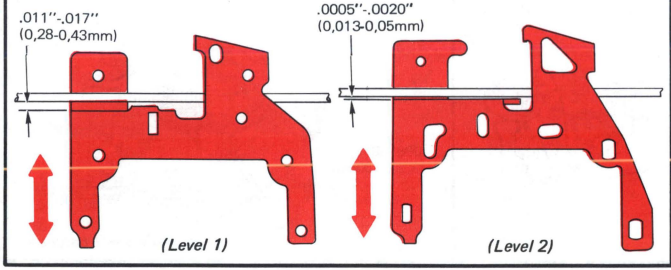
151 Escapement Rack (06-27)



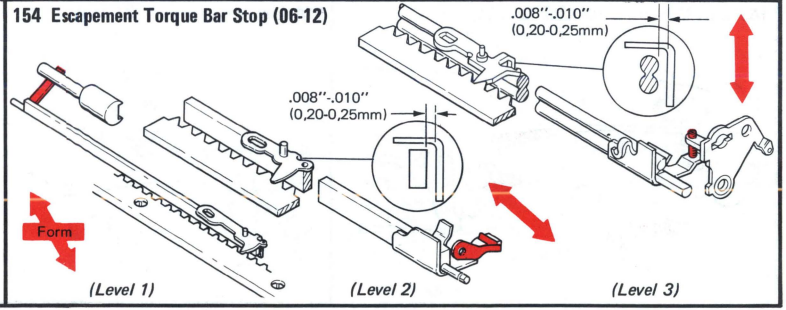
152 Escapement Torque Bar (06-29)



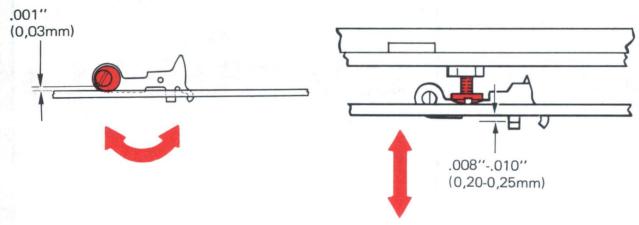
153 Escapement Bracket (06-23)



154 Escapement Torque Bar Stop (06-12)

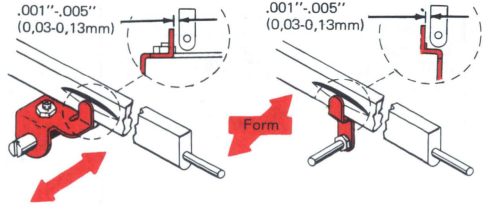


155 Torque Bar Backup (06-26)



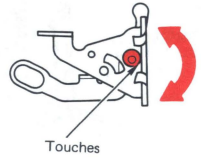
156 (Level 1 Only) (Level 2)

156 Torque Bar Backstop (06-39)



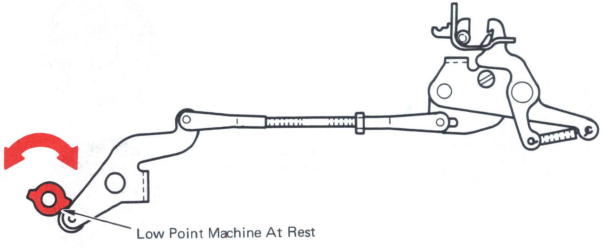
153, 155 (Level 1) (Level 2)

157 Pivot Pin Eccentric (06-19)

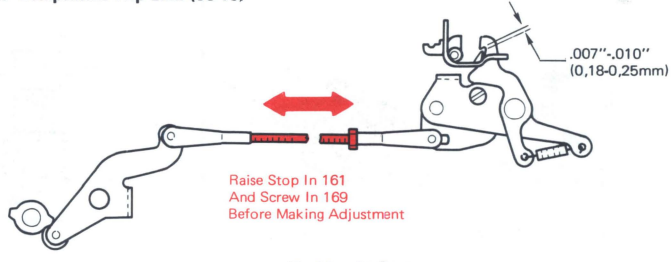


(Level 1)

158 Escapement Cam (06-07)

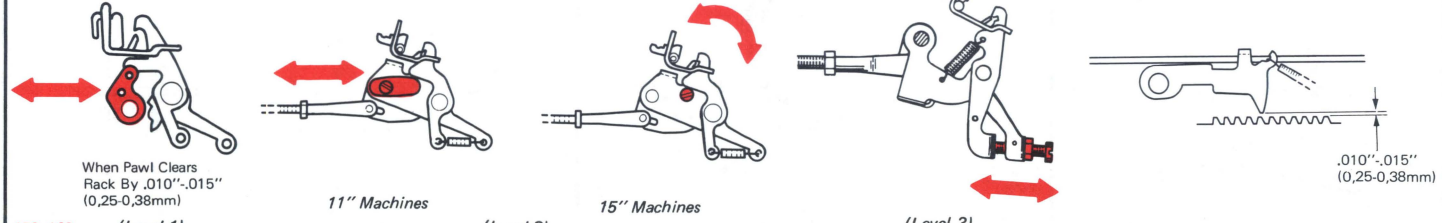


159 Escapement Trip Link (06-10)



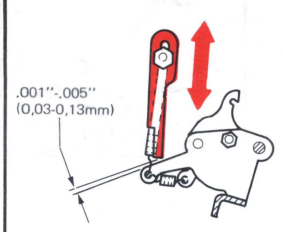
Machine At Rest

160 Trigger Knockoff (06-19)

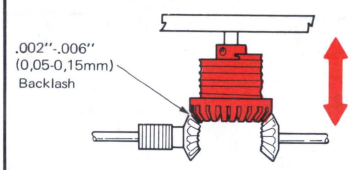


159, 160 (Level 1) *11" Machines* (Level 2) *15" Machines* (Level 3)

161 Trigger Lever Upstop (06-36)

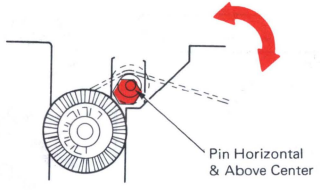


162 Cord Drum (18-01)

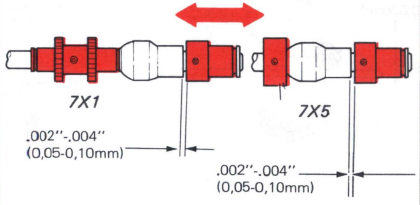


229

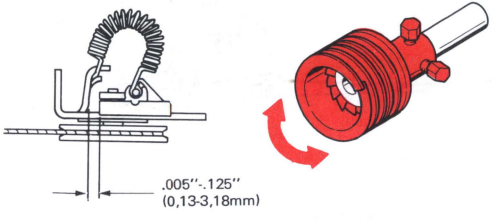
163 Eccentric Mounting Stud (18-26)



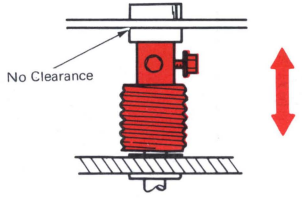
164 Operational Shaft End Play (25-33)



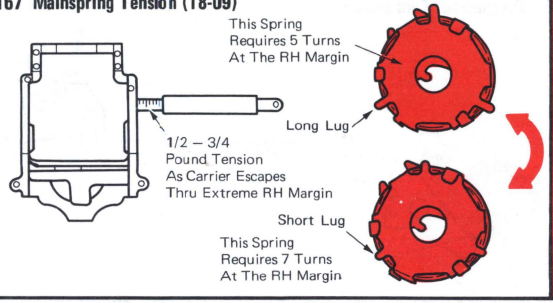
165 Cord Tension (03-31)



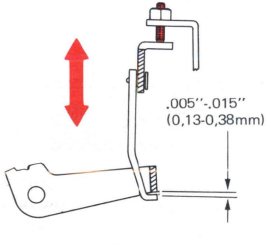
166 Carrier Return Cord Drum (03-31)



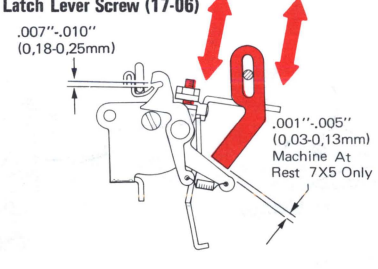
167 Mainspring Tension (18-09)



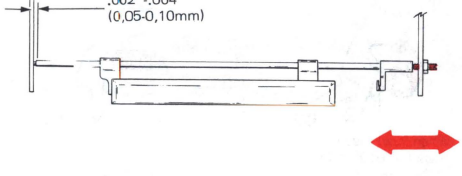
168 Operational Latch Height (Other) (17-02)



169 Latch Lever Screw (17-06)

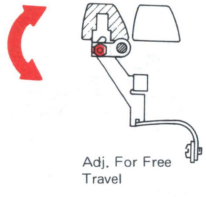


170 Spacebar Shaft (17-23)



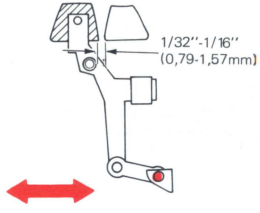
171 Spacebar Guides

(17-60)



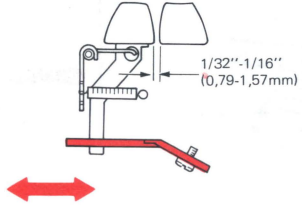
(Level 1)

(17-16)



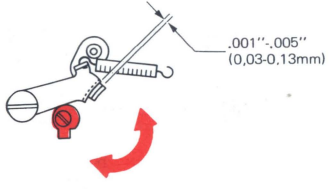
(Level 2)

(17-101)



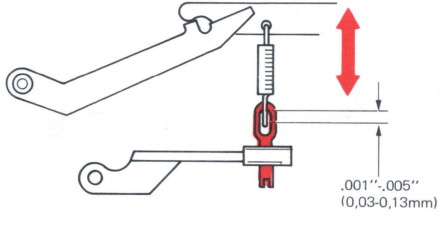
(Level 3)

172 Spacebar Repeat Stop



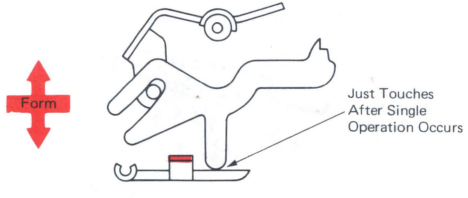
(Level 1)

(17-70)



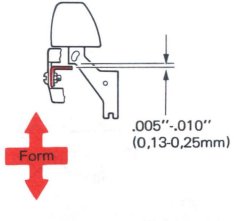
(Level 2)

(17-91)



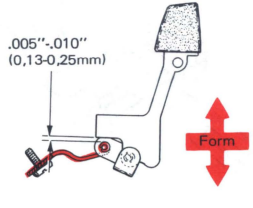
(Level 3)

173 Final Stop (17-61)



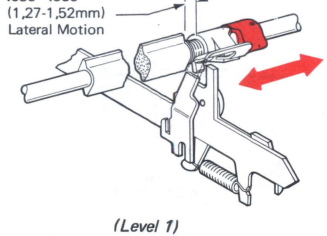
(Level 1)

(17-19)



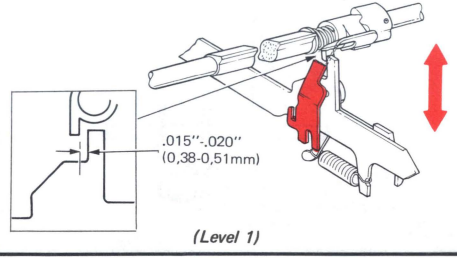
(Level 2)

174 Space To Print (17-47)



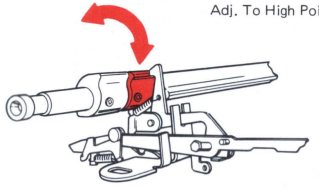
(Level 1)

175 Lockout Cam Guide (17-49)



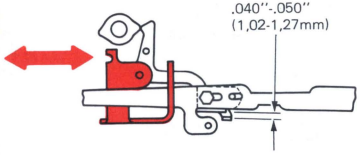
(Level 1)

176 Spacebar Interlock Cam (17-10)



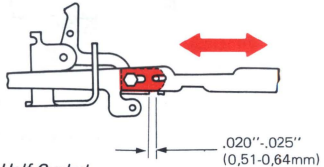
177 *(Level 2 – Machine At Rest)*

177 Spacebar Interlock Bracket (17-11)



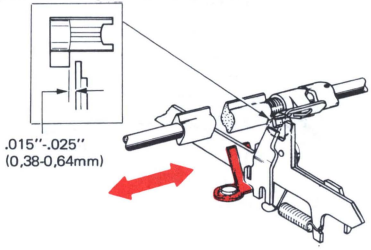
(Level 2)

178 Spacebar Interlock Stop (17-07)



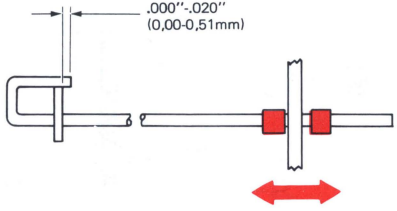
Machine Half-Cycled Interposer At Rest *(Level 2)*

179 Spacebar Interposer Guide (17-66)



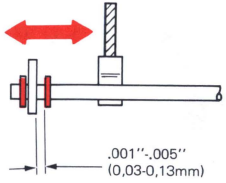
(Level 1)

180 Spacebar Interlock Bail (21-167)



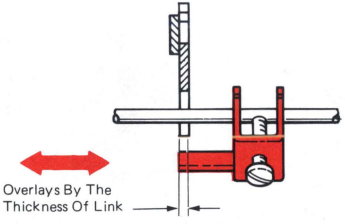
(Level 1)

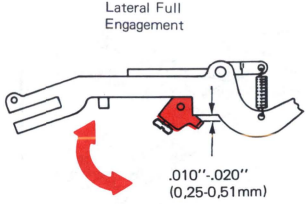
(21-167)

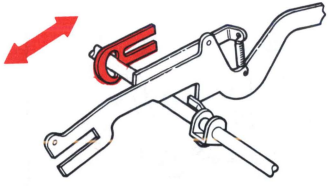


(Level 2)

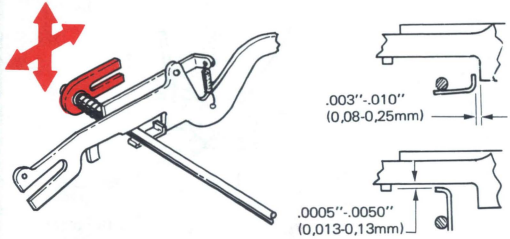
181 Interlock Pawl (21-155)



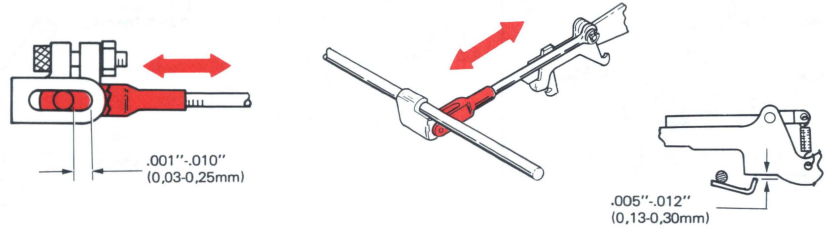




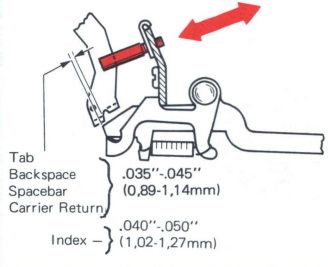
181 Interlock Pawl (Cont'd.) (21-154)



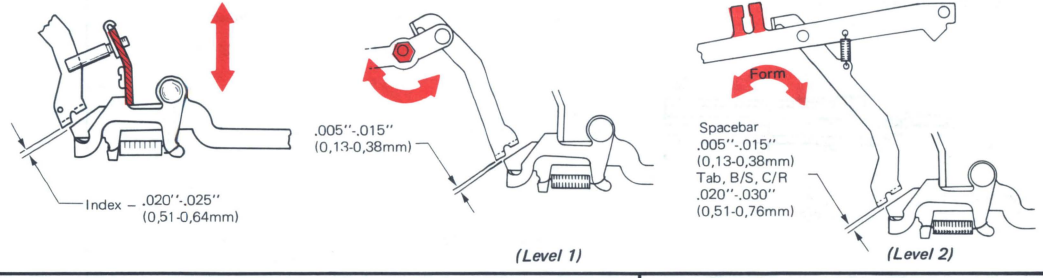
182 Spacebar Interlock Link (21-174)



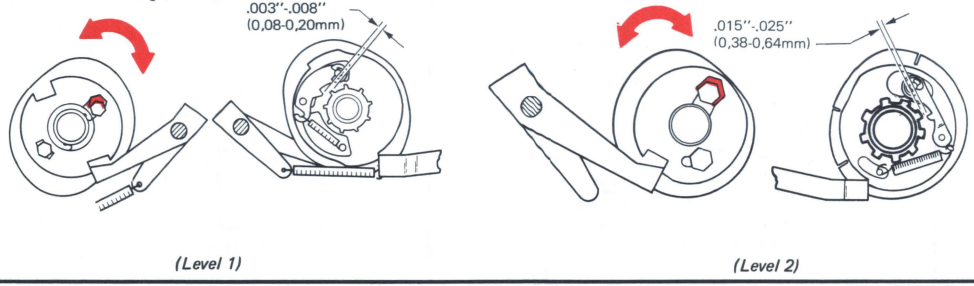
183 Operational Control (25-17)



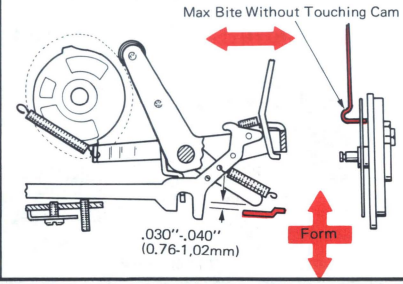
184 Keylever To Pawl Clearance (25-85) (17-72) (17-93)



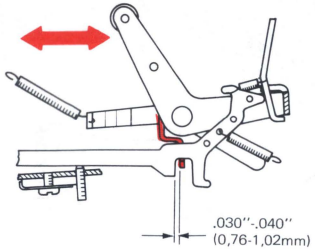
185 Cam Check Ring (25-26)



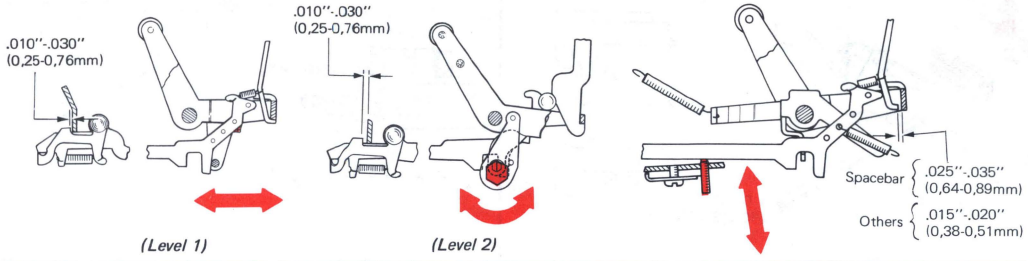
186 Release Arm Stop Pad (25-02)



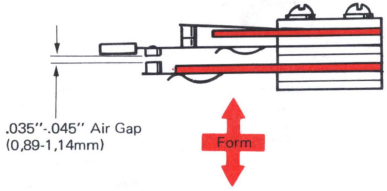
187 Clutch Release Arm (25-12)



188 Interposer Restoring Bail (25-32) (25-88) (25-24)



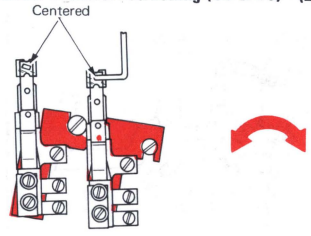
189 Operational Feedback Contact C5 & C6 (27-110, 111, 112)



	C-5 N/O		C-6 N/O	
Machine	Make	Break	Make	Break
731	55° ± 5	130° ± 5	170° ± 5	305° ± 5
735	55° ± 5	130° ± 5	170° ± 5	305° ± 5
775 (MT/ST)	55° ± 5	130° ± 5	170° ± 5	305° ± 5
655 (MT/SR)	65° ± 5	125° ± 5	170° ± 5	305° ± 5

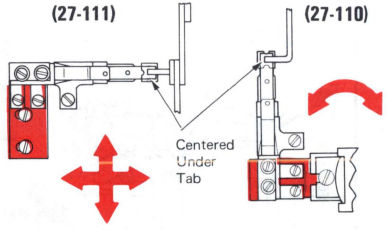
C-5 Transfer Time Is 10° To 20° Measured On The Rise Side Of The Cam C-6 Transfer Time Is 20° To 40° Measured On The Rise Side Of The Cam

190 Operational Contacts Positioning (C5 & C6) (27-112)



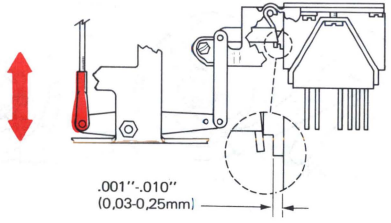
11" Machines

190 Operational Contacts Positioning (Cont'd) (C5 & C6)

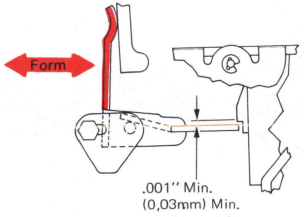


15" Machine

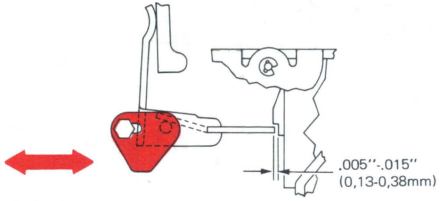
191 Operational Links (25-303)



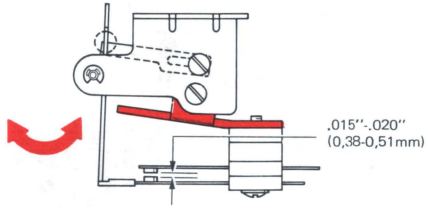
192 Contact Latches (27-47)



193 Adjusting Plate (27-45)

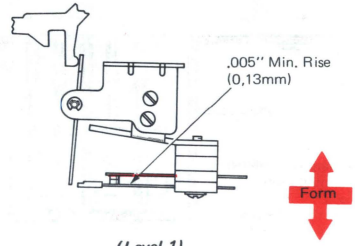


194 Contact Air Gap (27-67)



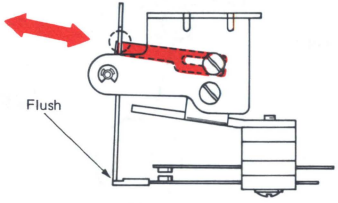
(Level 1)

195 N/O Contact Rise (27-68)

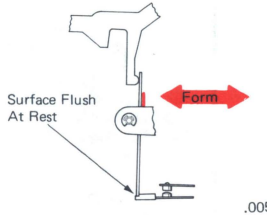


(Level 1)

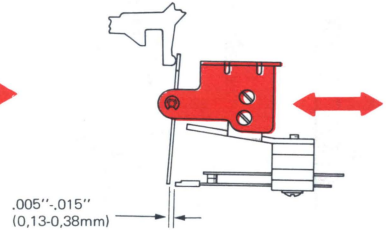
196 Contact Latches (27-78)



(27-75)

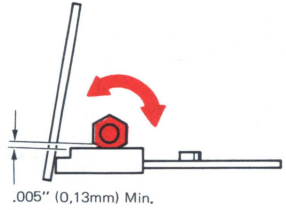


(27-64)



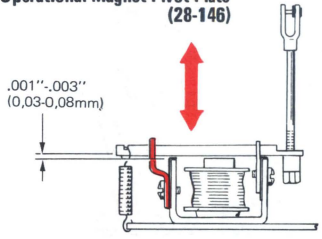
(Level 1)

197 Bail Eccentrics (Final) (27-325)



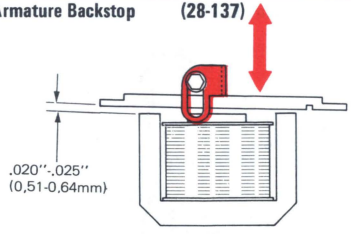
Cam On Its High Point

198 Operational Magnet Pivot Plate (28-146)



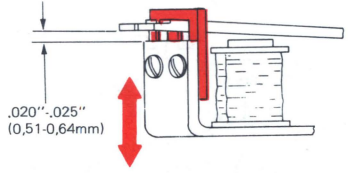
Manually Attracted

199 Armature Backstop (28-137)



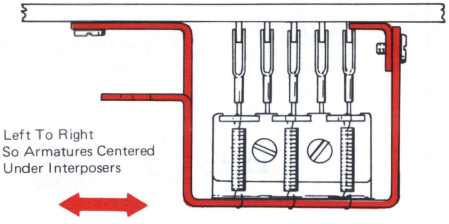
(Level 1 – At Rest)

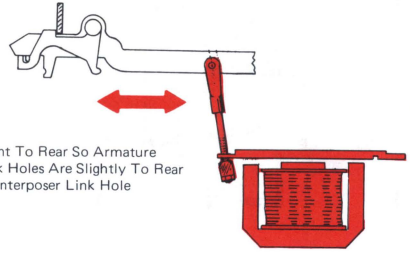
(28-146)



(Level 2 – At Rest)

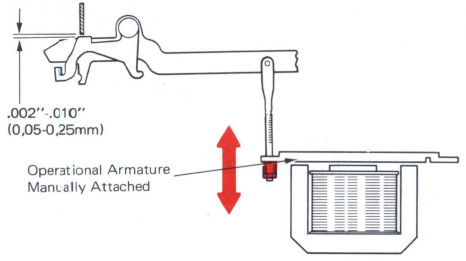
200 Operational Magnet Unit (28-140)



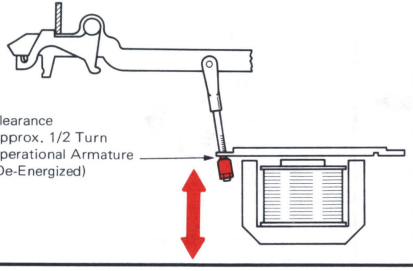


201

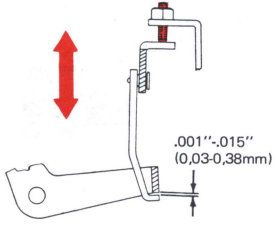
201 Magnet Pull Links (28-101)



201 Magnet Pull Links (Cont'd) (28-101)

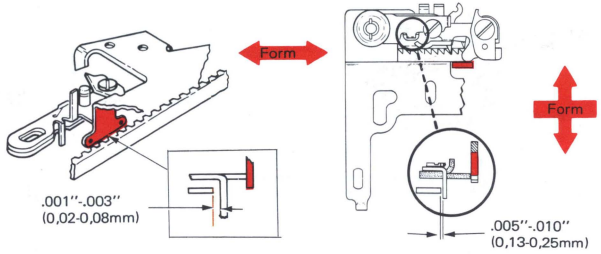


202 Latch Height (Backspace) (01-09)

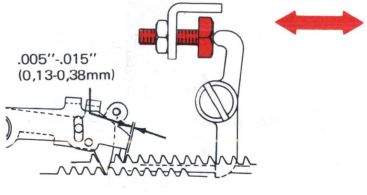


204, 205

203 Tab Lever Stop (06-23)

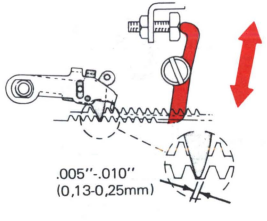


204 Backspace Rack (01-06)

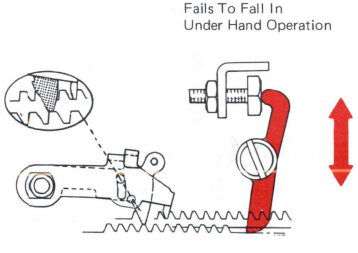


205

205 Backspace Motion (01-11)

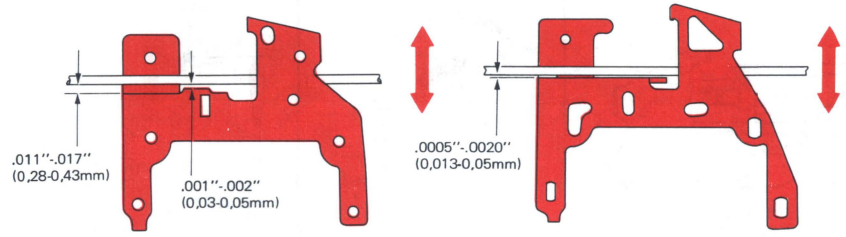


204 *(Level 1)*

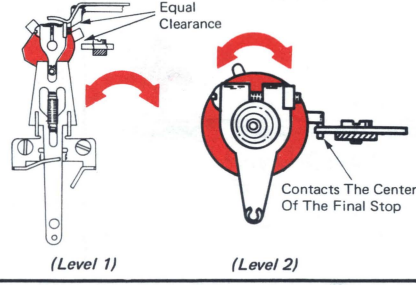


(Level 2)

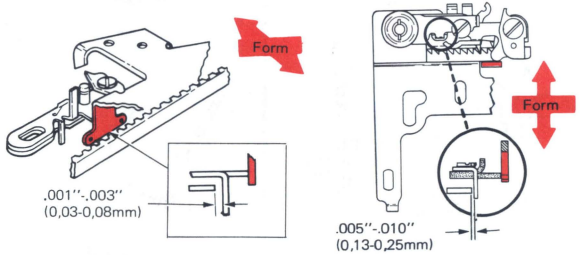
206 Escapement Bracket (06-23)



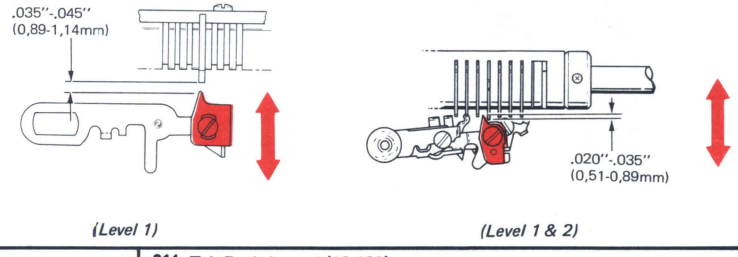
207 Tab Rack Rotational (18-114)



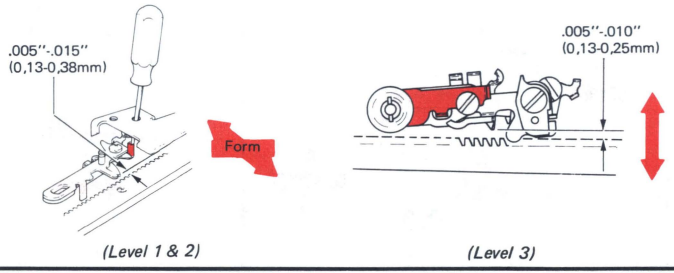
208 Tab Lever Stop (06-23)



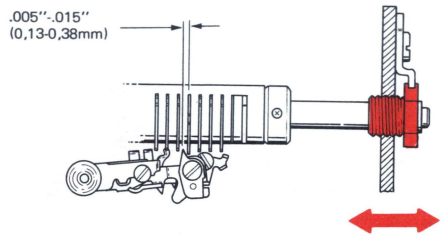
209 Tab Lever Pawl (18-78)



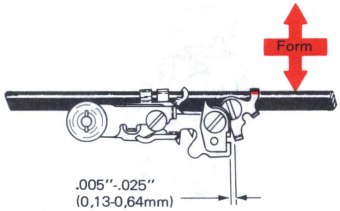
210 Pawl Clearance (18-47)



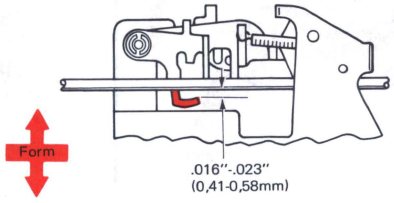
211 Tab Rack Lateral (18-132)



212 Tab Interlock (18-57)

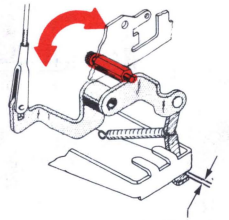


213 Tab Trigger Extension (18-62)

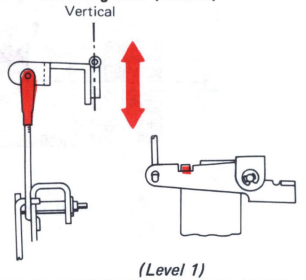


(Level 2)

214 Tab Latch Height (18-228)

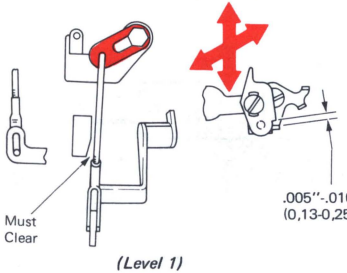


215 Actuating Link (18-241)



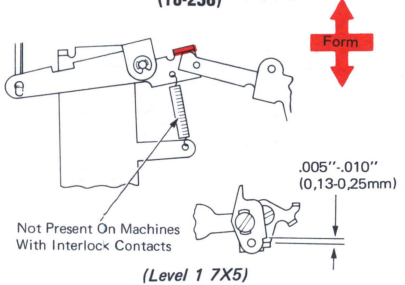
(Level 1)

216 Tab Lever Overthrow (18-225)



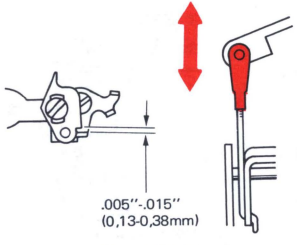
(Level 1)

(18-238)



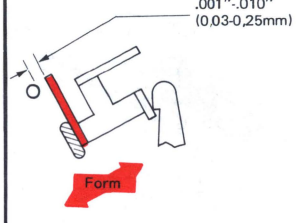
(Level 1 7X5)

(18-240)



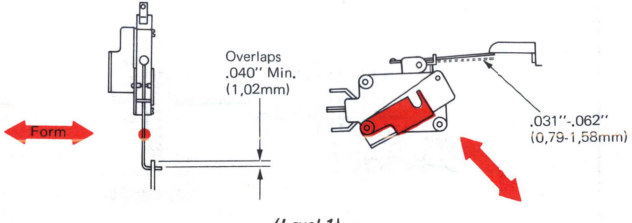
(Level 2 & 3)

217 Tab Torque Bar Overthrow Stop (18-309)



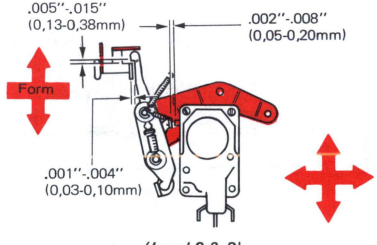
(Level 2 & 3)

218 Interlock Switch (27-150)



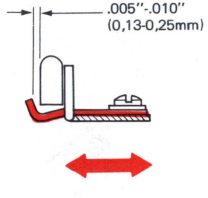
(Level 1)

219 Interlock Switch (18-253)



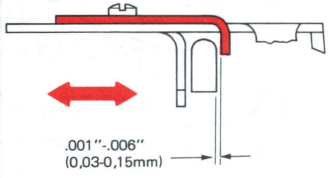
(Level 2 & 3)

220 Tab Lockout Lever (18-46)



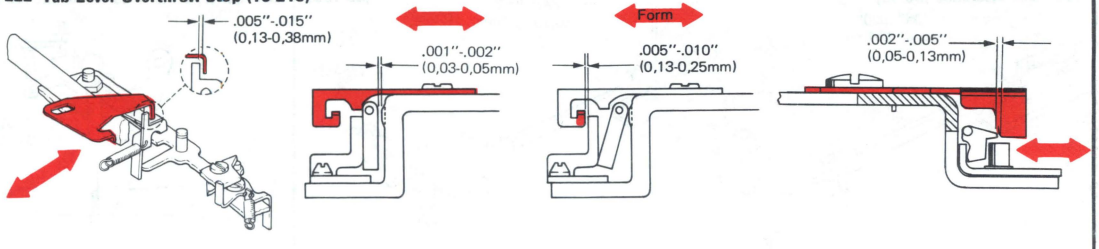
(Level 1)

221 Tab Torque Bar Support (18-218)



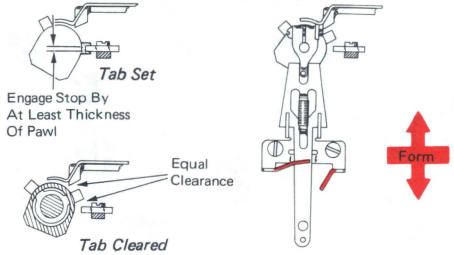
(Level 1)

222 Tab Lever Overthrow Stop (18-218)



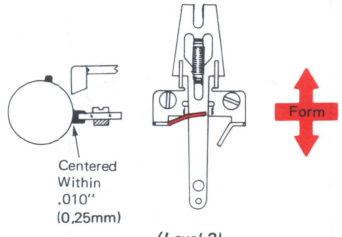
(Level 1) *(Level 2)* *(Level 2)* *(Level 3 — At Rest)*

223 Tab Set And Clear Bracket (18-110)



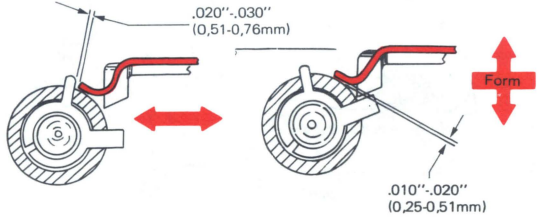
(Level 1)

224 Tab Set Stop Lug (18-110)

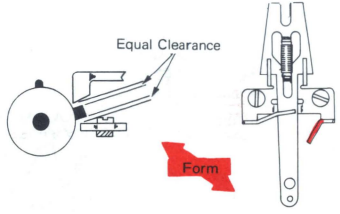


(Level 2)

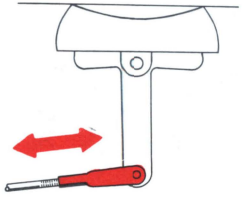
225 Tab Clear Bracket (18-125)



226 Tab Clear Stop Lug (18-110)

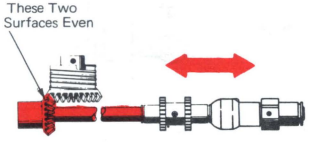


227 Tab Set & Clear Link (18-103)



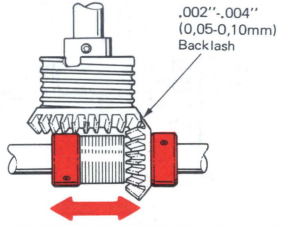
Match Keyboard Slope

228 Gear Mesh (25-44)

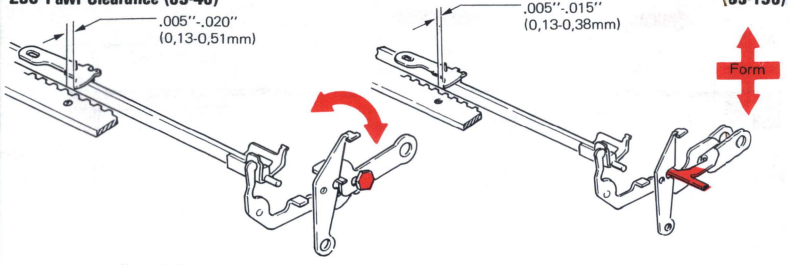


162, 164, 229, 237

229 Tab Pinion Backlash (25-47)

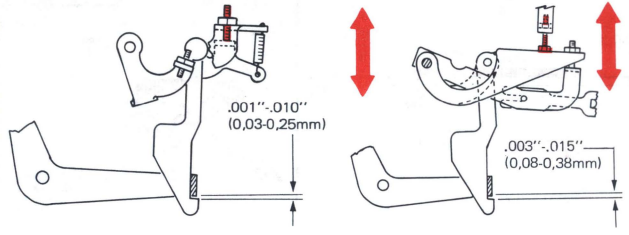


230 Pawl Clearance (03-48) (03-190)



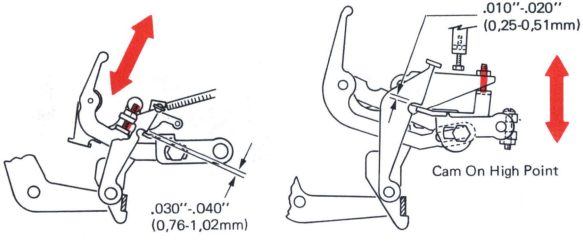
(Level 1) *(Level 2)*

231 Carrier Return Latch Height (03-52)



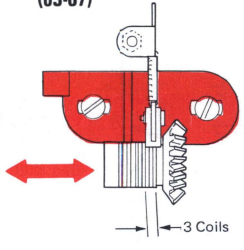
(Level 1) *(Level 2)*

232 Clutch Latch Overthrow (03-195)

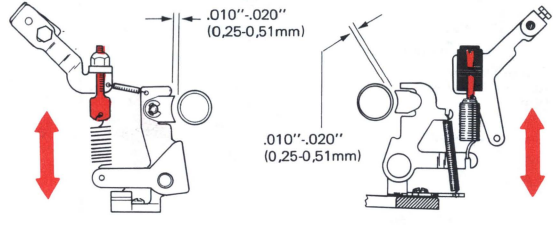


7X1 *7X5 Cam On High Point*

233 Carrier Return Shoe Overlap (03-07)

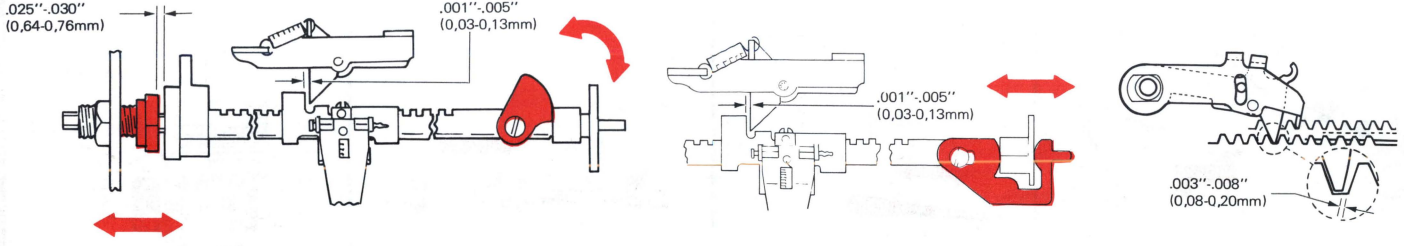


234 Carrier Return Clearance (03-131)



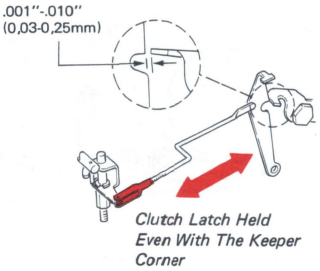
(Level 1) *(Level 2)*

235 Overbank (09-04) (09-66)

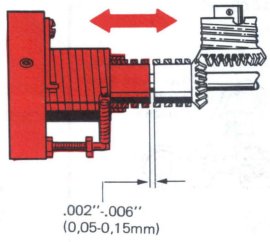


(Level 1) *(Level 2)*

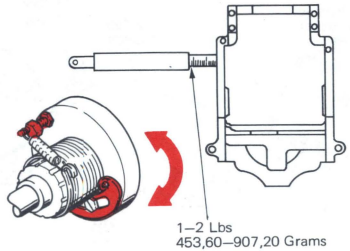
236 Clutch Unlatching (03-63)



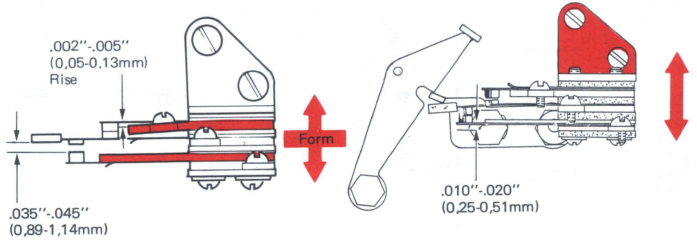
237 Carrier Return Pinion End Play (25-24)



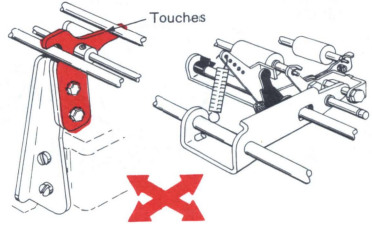
238 Torque Limiter (25-38)



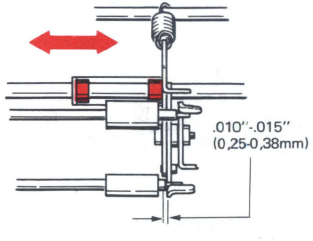
239 Carrier Return Interlock Contacts (27-180)



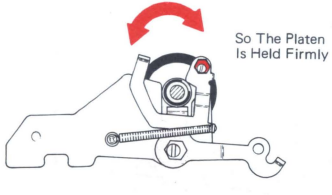
240 Paper Feed Support (22-169)



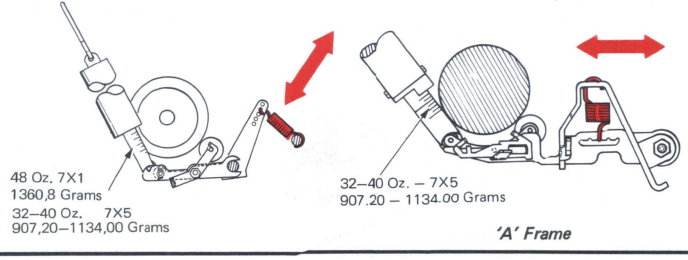
241 Feed Roll End Play (22-155)



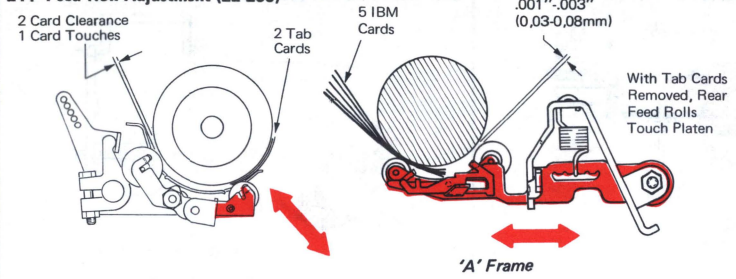
242 Platen Latches (22-10)



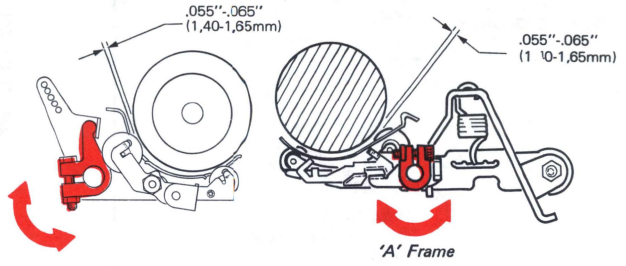
243 Feed Roll Tension (22-59)



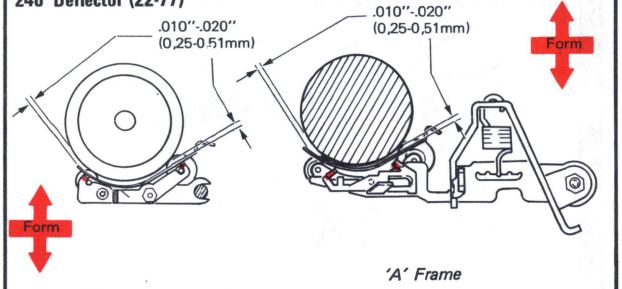
244 Feed Roll Adjustment (22-285)



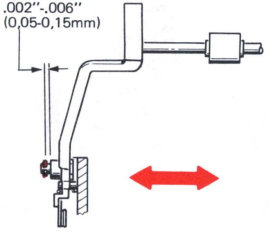
245 Paper Release (22-62) (22-283)



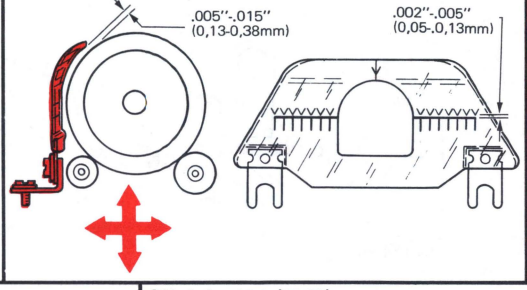
246 Deflector (22-77)



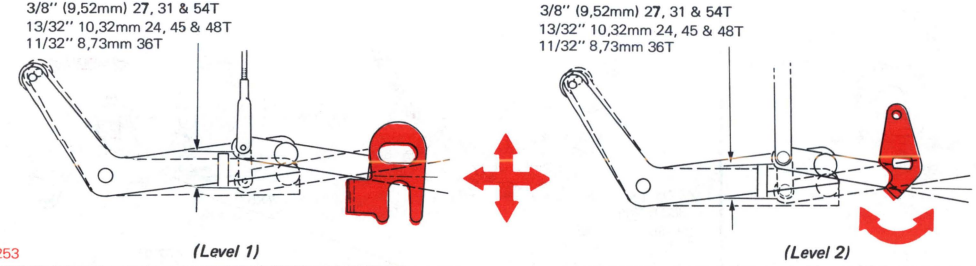
247 Paper Bail (22-32)



248 Cardholder (22-129)

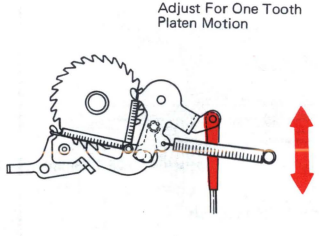


249 Multiplying Lever Stop (20-10)

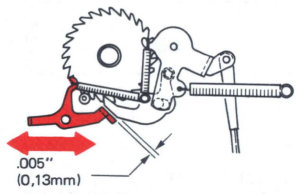


253

250 Index Link (20-22)

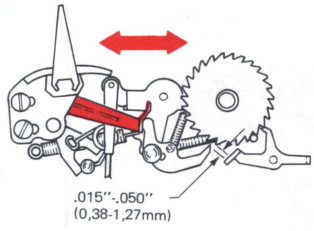


251 Platen Overthrow Stop (20-34)

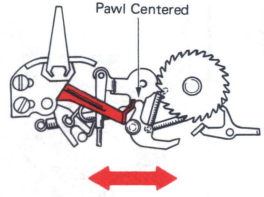


(Level 2 Cam On High Point)

252 Index Selector Cam (20-21)

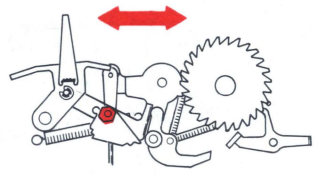


Cam At Rest Double Space Position



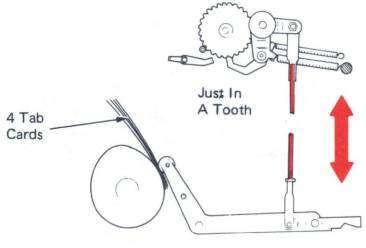
(Level 2 Cam At Rest Single Space Position)

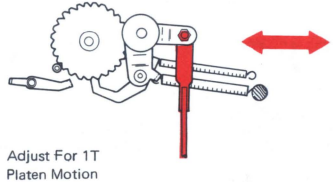
(20-190)



54 Tooth Only

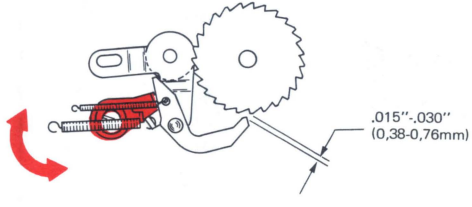
253 Index Link (20-22)





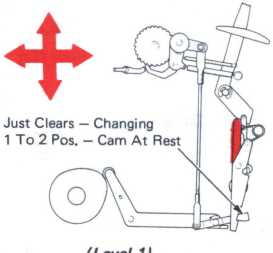
(Level 1)

254 Upper Index Pawl Stop (20-71)



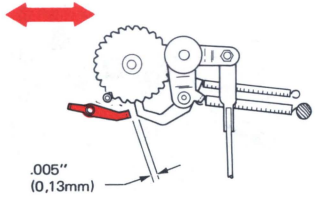
(Level 1)

255 Multiplying Lever Control (20-55)



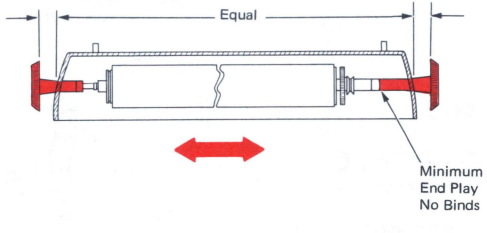
(Level 1)

256 Platen Overthrow Stop (20-60)

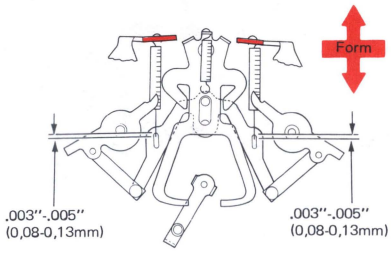


(Level 1)

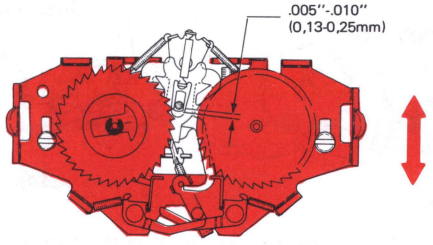
257 Platen Knobs (12-01)



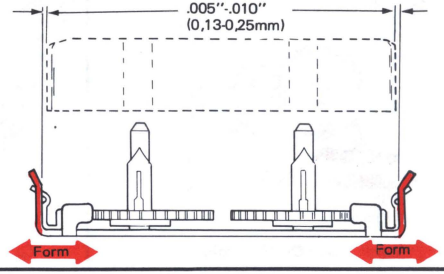
258 Centering Springs (13-28)



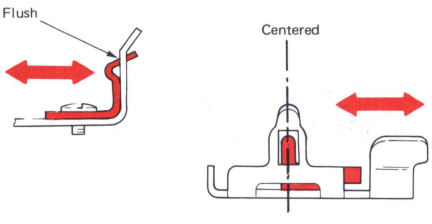
259 Ribbon Feed Plate (13-38)



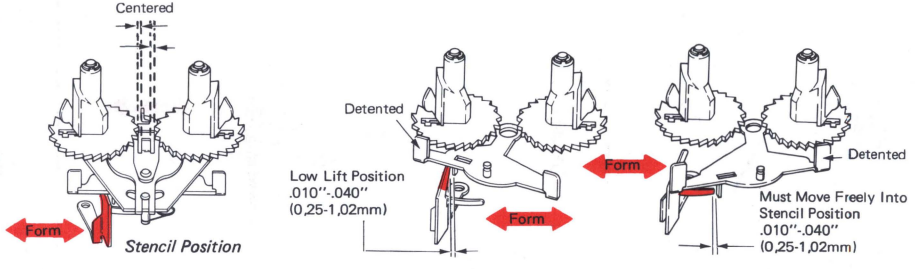
260 Guide Lugs (13-38)



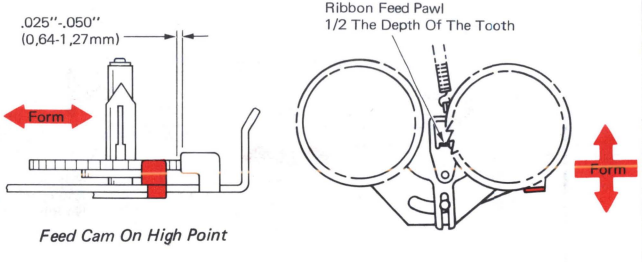
261 Cartridge Retainer Springs (13-77)



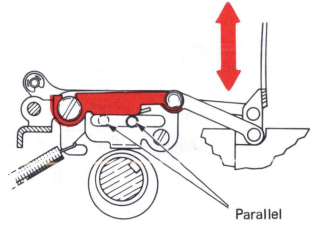
262 Ribbon Lift Lever (13-55) (13-73)



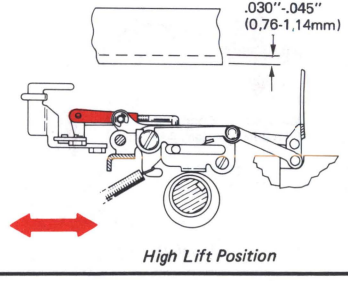
263 Ratchet Detent (13-75)



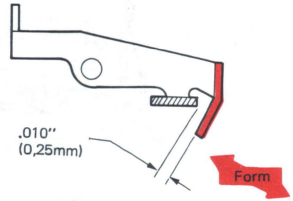
264 Ribbon Lift Guide Post (13-37)



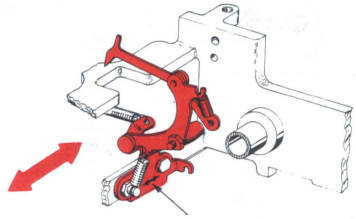
265 Ribbon Lift Control Link (13-63)



266 Stencil Lockout (13-49)

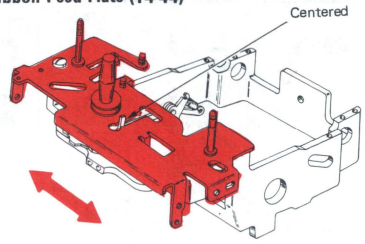


267 Cam Follower Mounting Bracket (14-158)



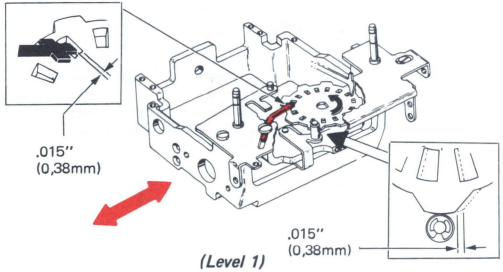
(Level 1)

268 Ribbon Feed Plate (14-44)

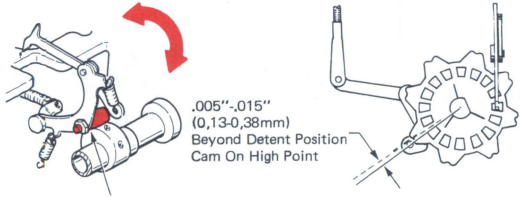


(Level 1)

269 Feed & Lift Wheel Detenting (14-48)

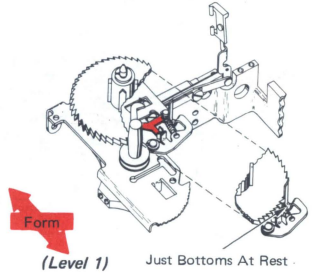


(Level 1)



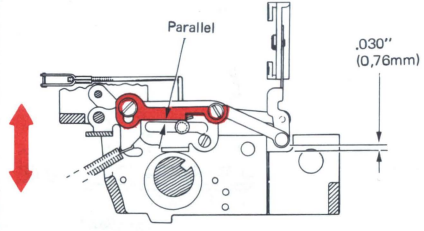
(Level 1) *(Level 1)*

270 Brake Actuating Lever (14-30)



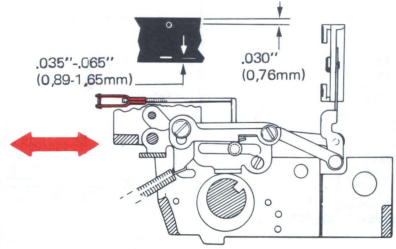
(Level 1)

271 Ribbon Lift Guide Plate (14-102)

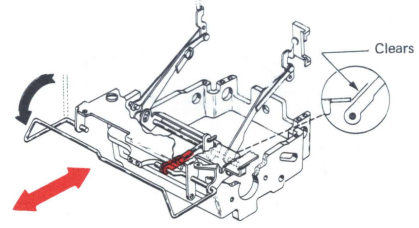


Refer To Ribbon Samples (Page 111)

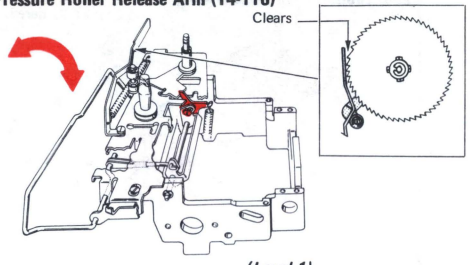
272 Ribbon Lift Link (14-130)



273 Load Lever Link (14-148)

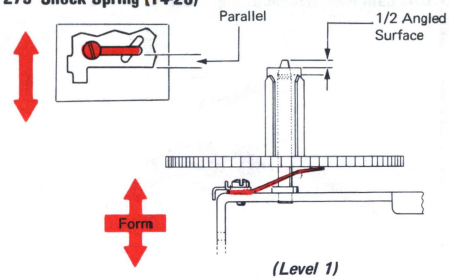


274 Pressure Roller Release Arm (14-116)

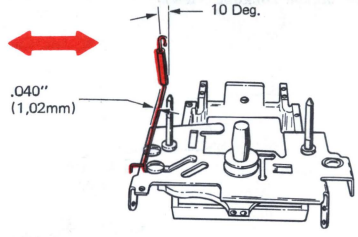


(Level 1)

275 Shock Spring (14-26)

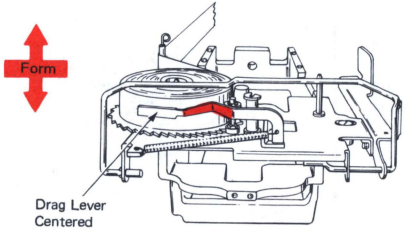


(Level 1)



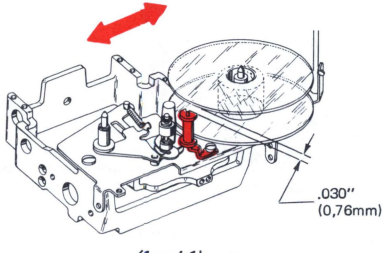
(Level 1)

276 Drag Lever (14-80)

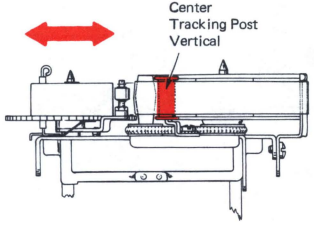


(Level 1)

277 Tracking Post (14-82)

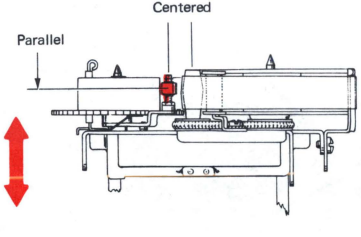


(Level 1)

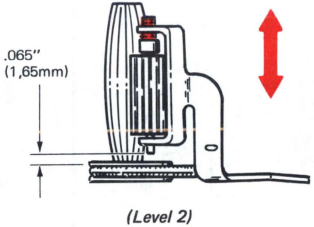


(Level 1)

278 Pressure Roller (14-229)

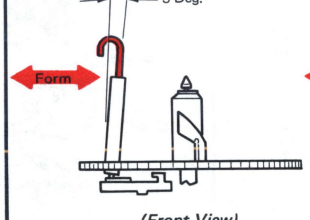


(Level 1)

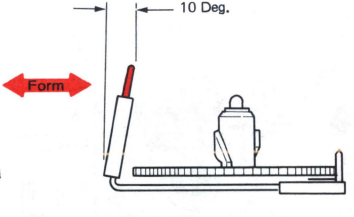


(Level 2)

279 Shock Spring (14-235)



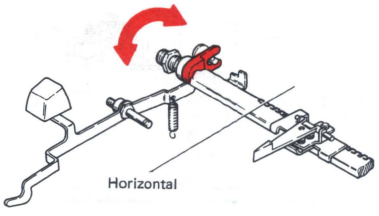
(Front View)



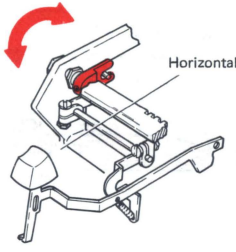
(Side View)

(Level 2)

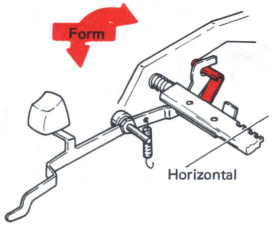
280 Margin Rack Horizontal (09-61)



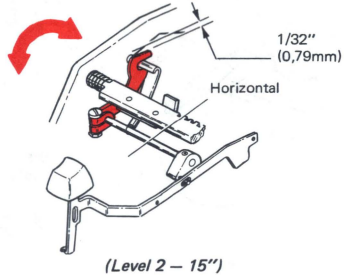
(Level 1 – 11")



(Level 1 – 15")

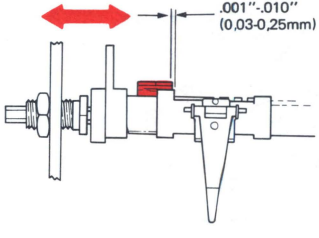


(Level 2 – 11")

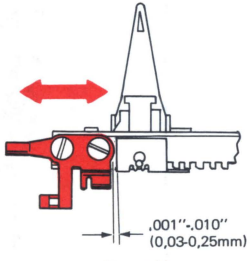


(Level 2 – 15")

281 LH Final Stop (09-61)

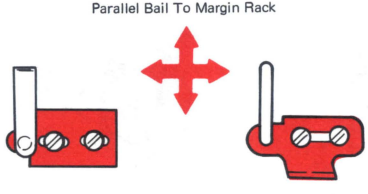


(Level 1)

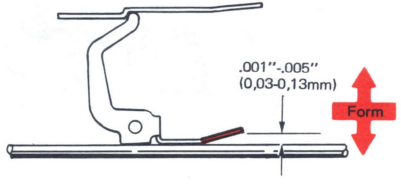


(Level 2)

282 Bellringer Bail Adjusting Plate (09-201)

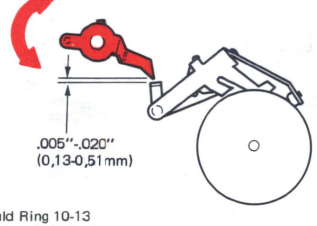


283 Bellringer Bellcrank (09-99)



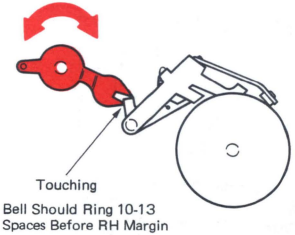
(Level 2 – Carrier In Next To Last Space)

284 Bellringer Bail Lever (09-135)



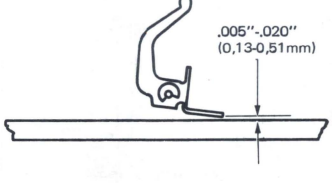
Bell Should Ring 10-13
Spaces Before RH Margin

(Level 2)



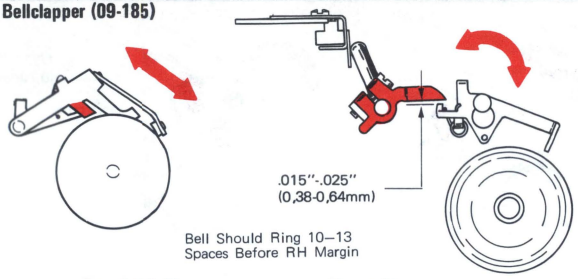
Bell Should Ring 10-13
Spaces Before RH Margin

(Level 2)



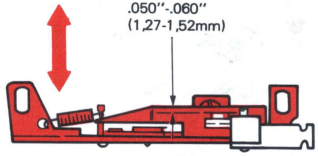
(Level 2)

285 Bellclapper (09-185)

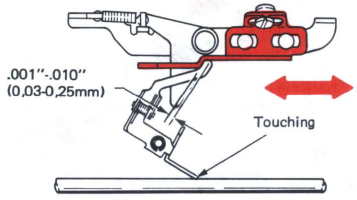


(Level 1 & 2) *(Level 3)*

286 Linelock Bracket (09-18)

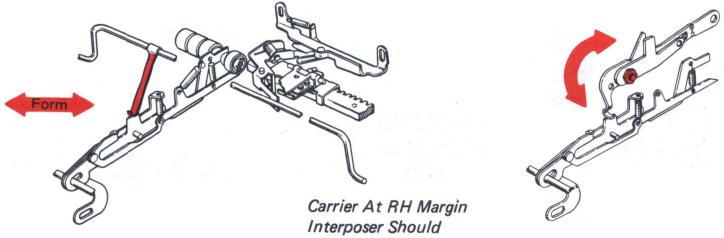


287 Linelock Bracket Plate (09-96)



Carrier In
Next To Last Column

288 Linelock (09-12) (09-277)

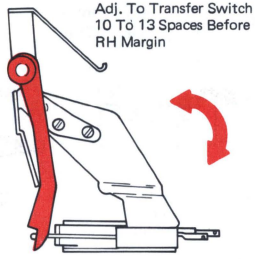


(Level 1)

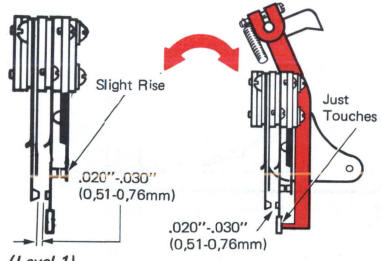
Carrier At RH Margin
Interposer Should
Be Bottomed

(Level 2)

289 Zone Switch (27-258)

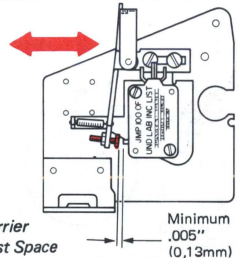


290 Last Column Contacts (27-245)



(Level 1)

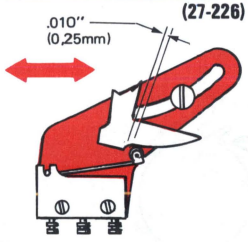
291 End Of Line Switch (27-215)



Carrier
Last Space
From Margin

(Level 2)

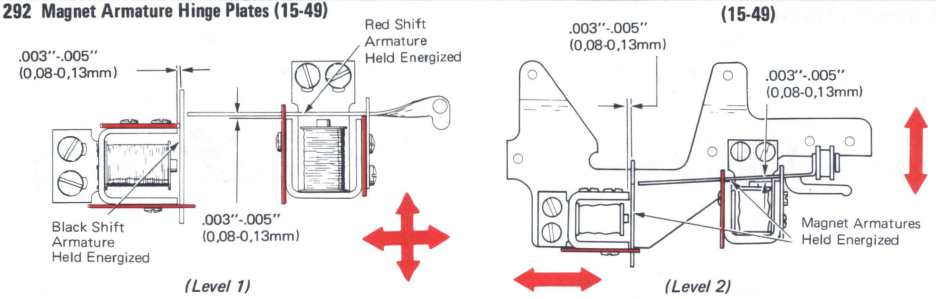
(27-226)



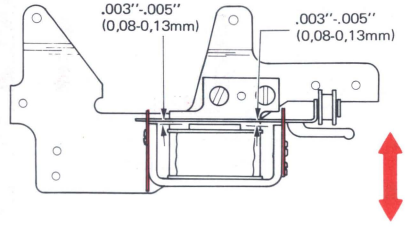
(Level 3)

(27-230)

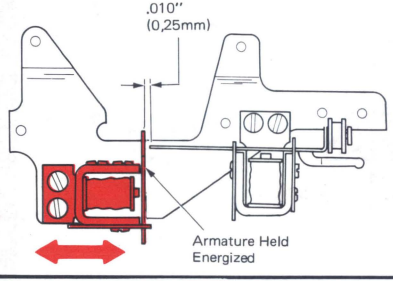
292 Magnet Armature Hinge Plates (15-49)



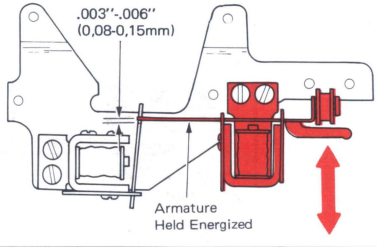
293 Single Magnet Adjustments (15-49)



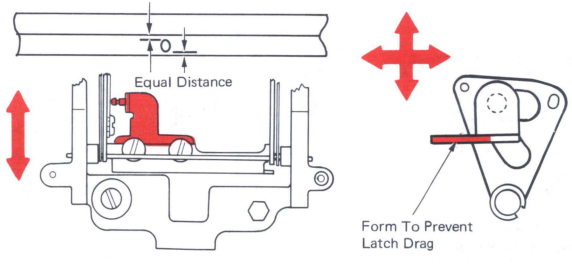
294 Black Magnet Position (15-53)



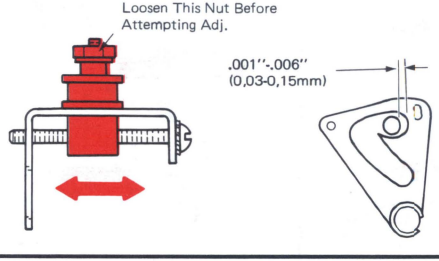
295 Red Magnet Position (15-56)



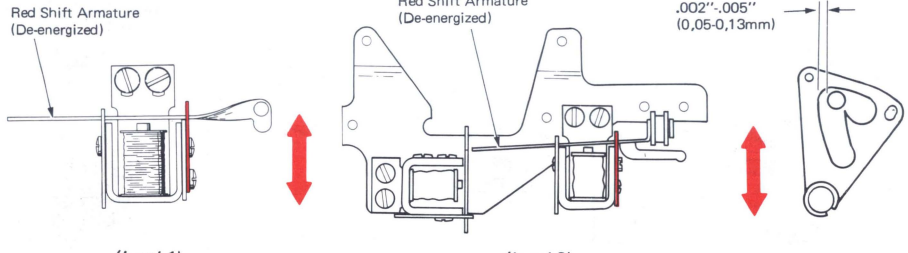
296 Pivot Arm (15-09)



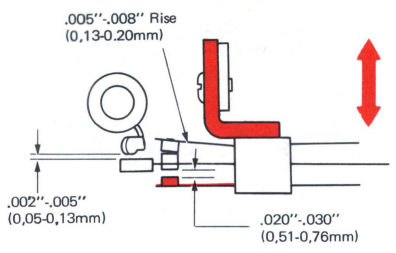
297 RH Tape Pulley (15-20)



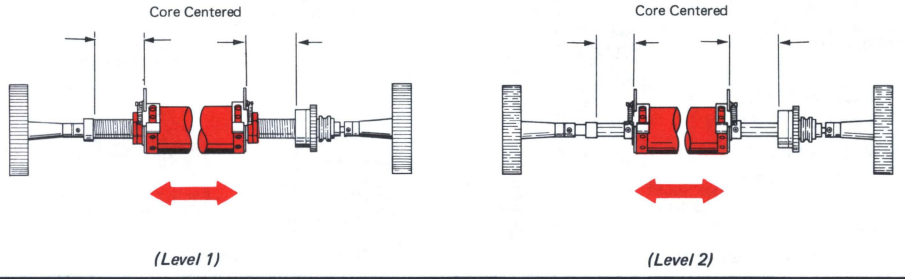
298 Red Ribbon Armature Backstop (15-58)



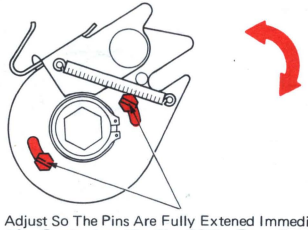
299 Ribbon Mode Contacts (15-33)



300 Platen Core (49-130)

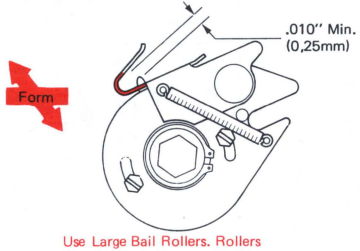


301 Pinwheel Control Plate (49-105)



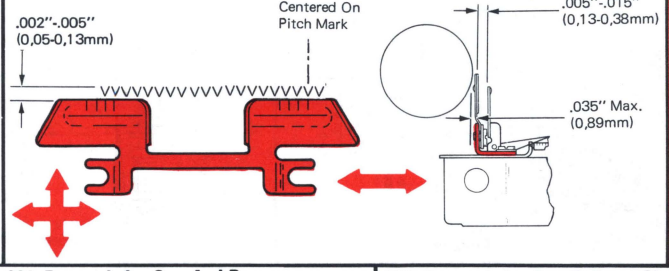
Adjust So The Pins Are Fully Extened Immediately After Passing Into The Slot Of The Form Guide

302 Paper Guides (49-105)

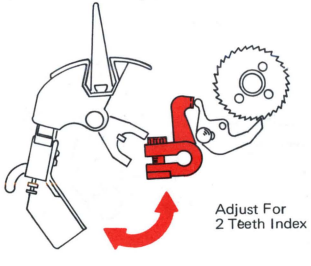


Use Large Bail Rollers. Rollers Should Apply Pressure To Platen.

303 Cardholder (49-21)

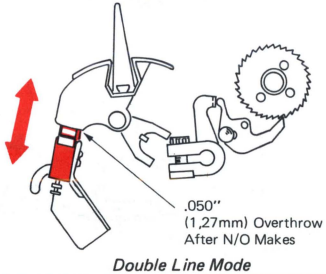


304 Index Pawl Entry (51-304)



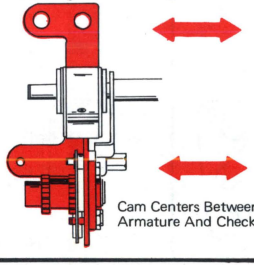
Adjust For 2 Teeth Index

305 Selection Switch (51-309)



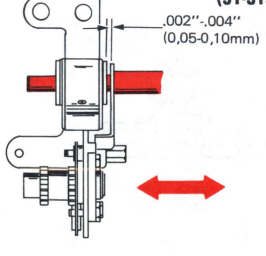
Double Line Mode

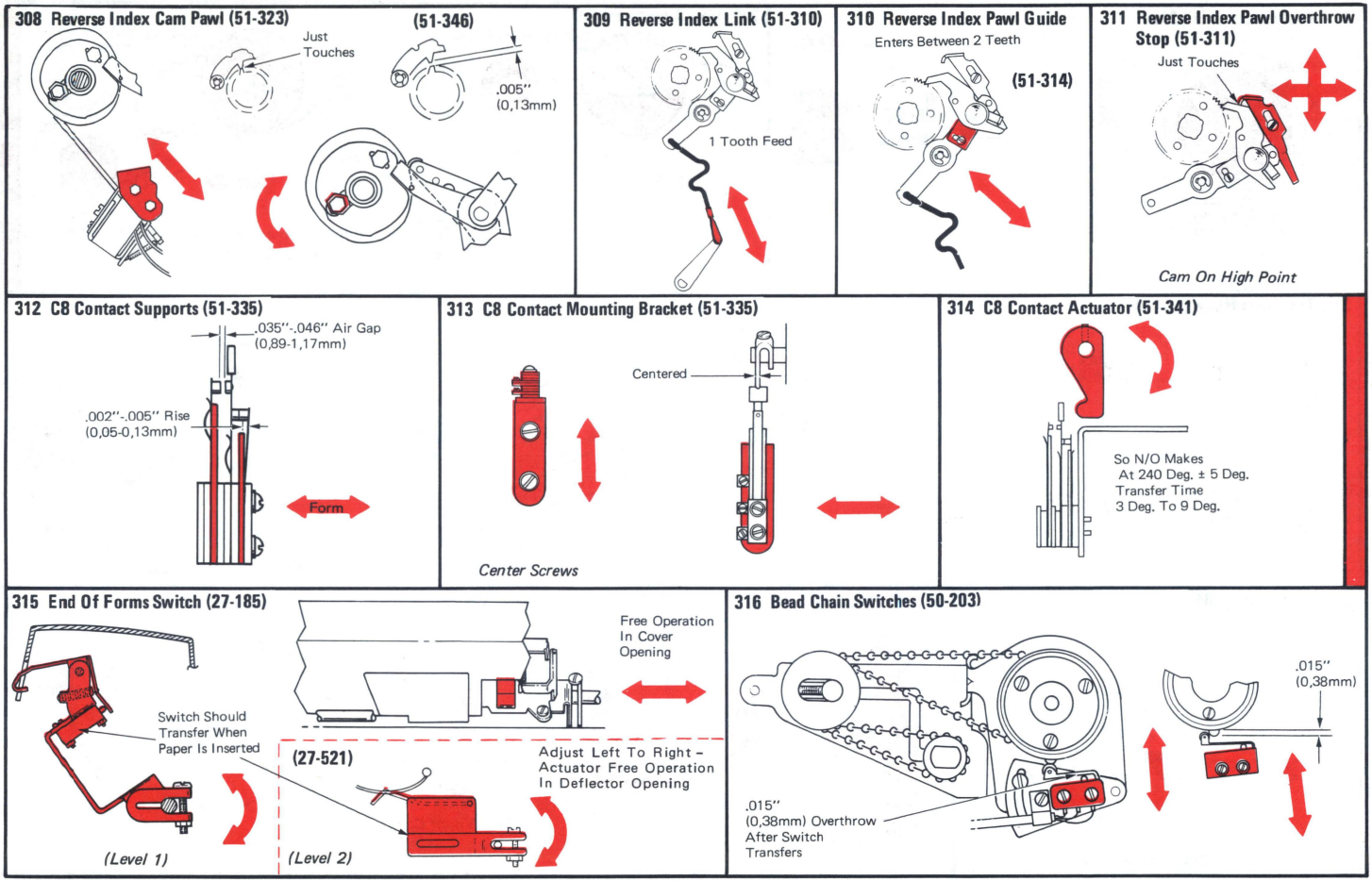
306 Reverse Index Cam And Reverse Index Magnet Mounting Bracket (51-333)



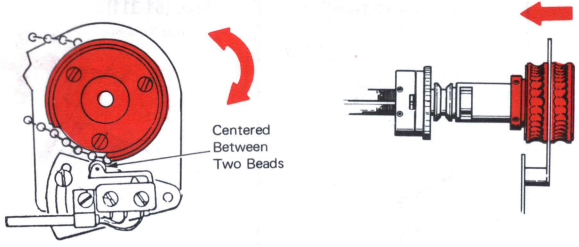
Cam Centers Between Armature And Check Pawl

307 Reverse Index Cam Follower Shaft (51-319)

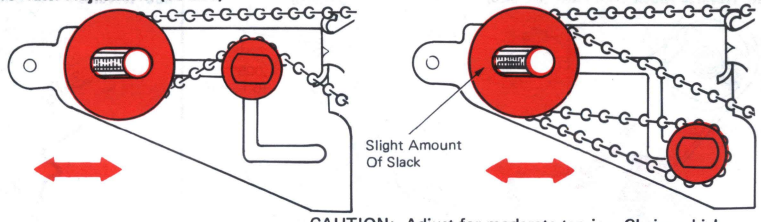



308 Reverse Index Cam Pawl (51-323)
(51-346)
Just Touches
.005" (0,13mm)
309 Reverse Index Link (51-310)
1 Tooth Feed
310 Reverse Index Pawl Guide
Enters Between 2 Teeth
(51-314)
311 Reverse Index Pawl Overthrow Stop (51-311)
Just Touches
Cam On High Point
312 C8 Contact Supports (51-335)
.035"-.046" Air Gap (0,89-1,17mm)
.002"-.005" Rise (0,05-0,13mm)
Form
313 C8 Contact Mounting Bracket (51-335)
Centered
Center Screws
314 C8 Contact Actuator (51-341)
So N/O Makes At 240 Deg. ± 5 Deg. Transfer Time 3 Deg. To 9 Deg.
315 End Of Forms Switch (27-185)
Free Operation In Cover Opening
Switch Should Transfer When Paper Is Inserted
(27-521)
Adjust Left To Right - Actuator Free Operation In Deflector Opening
(Level 1)
(Level 2)
316 Bead Chain Switches (50-203)
.015" (0,38mm)
.015" (0,38mm) Overthrow After Switch Transfers

317 Chain Position (50-216)

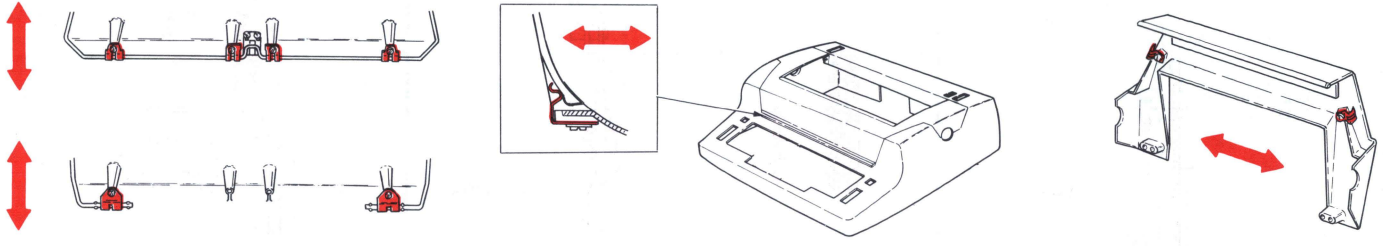


318 Idler Adjustment (50-218)



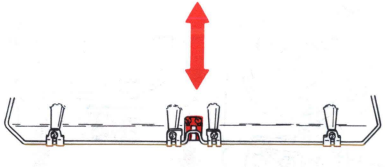
CAUTION: Adjust for moderate tension. Chains which are tight could cause malfunctions in the index mechanism.

319 Top Cover Hinge (04-149)



So Contour Matches Center Cover *(Level 1)* *Latches Securely* *(Level 2)*

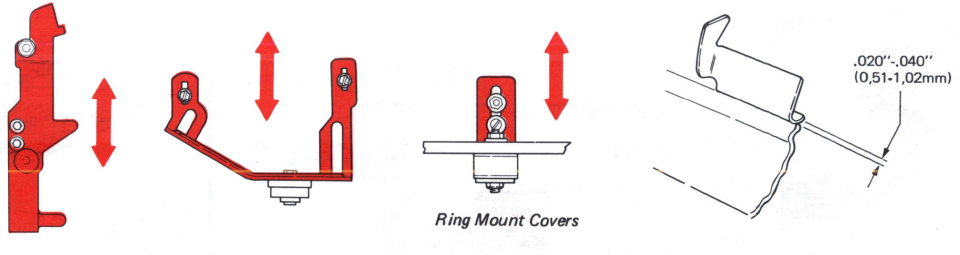
320 Hinge Spring (04-143)



Cover Detented

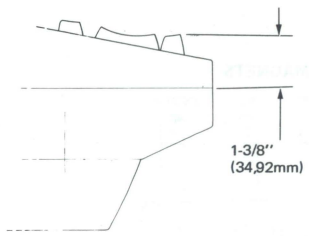
So Cover Is Held Open

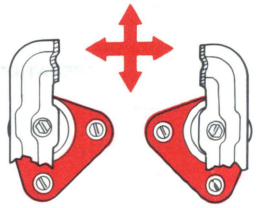
321 Printer Position (04-127) (04-138) (04-14)

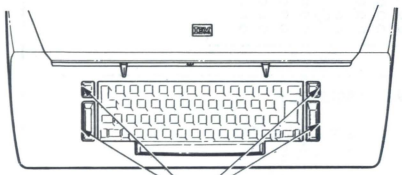


Ring Mount Covers

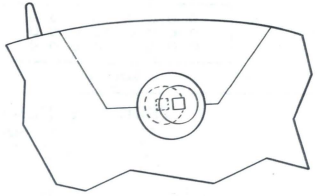
322 Printer Position (Cont'd.) (04-122)







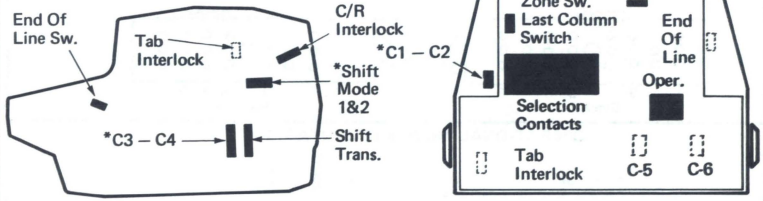
Equal Clearance With All Keybuttons



Film Ribbon Samples (See Frame 271)

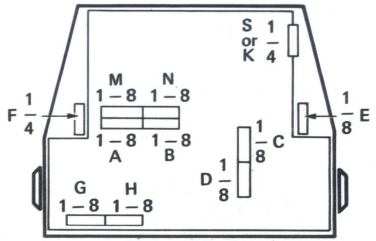
I/O CONTACT LOCATIONS

***NOTE:** Contact groups are numbered from left to right when looking from the front.



(Bottom View)

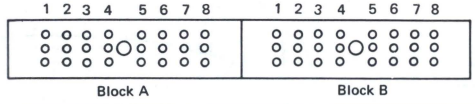
I/O TERMINAL BLOCK LOCATIONS



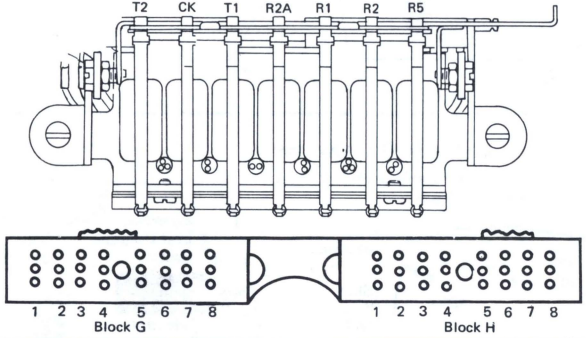
(Bottom View)

NOTE: No "Selectric" I/O Printer has all illustrated terminal blocks. The terminal blocks present appear in this configuration and are designated by indicated lettering.

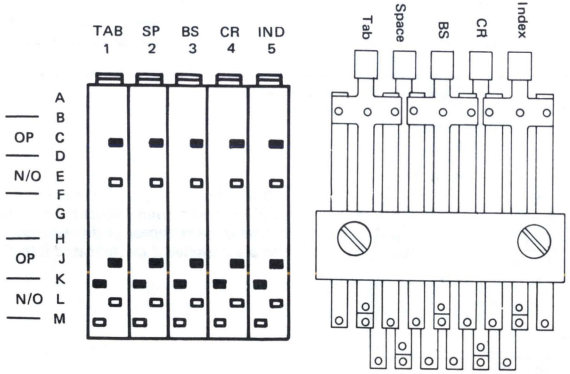
SELECTION CONTACT TERMINAL BLOCKS



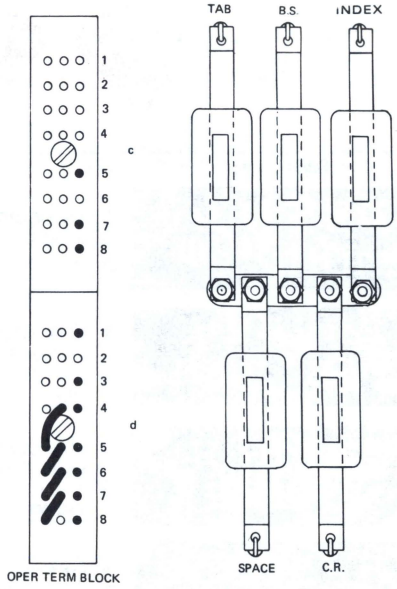
PRINT SELECTION MAGNET ASSEMBLY



OPERATIONAL TRANSMIT CONTACTS



OPERATIONAL MAGNETS



BCD MACHINE							
	OPERATIONAL BIT CODE						
OPERATION	1	2	4	8	A	B	C K
Space	1	0	1	1	0	0	0
Backspace	0	1	1	1	0	1	1
Tab	1	0	1	1	1	0	1
CR	1	0	1	1	0	1	1
Index	1	0	1	1	1	1	0
UC SH.	0	1	1	1	0	0	0
LC SH.	0	1	1	1	1	1	0

NOTES:

1. Both a 4 and an 8 bit are transmitted during each operational function. Closing any N/O operational feedback contact (C3, C4, C5, or C6) connects terminal X (see BCD wiring diagram) to lines 4 and 8.

2. All other bits for operational functions are generated by closure of the operational transmitting contacts and are gated by either C3, C4, C5, or C6.

BCD MACHINE				
CONTACTS INVOLVED IN GENERATION OF ALPHA-NUMERIC BITS				
BIT	TERM. IN	THROUGH DIODES, PRINT SELECTION TRANSMITTING AND SHIFT MODE CONTACTS	TERM. OUT	CASE
1	1	R5 N/C & R2A* N/O	y	U or L
		R5 N/O & R2A N/C & No. 2 N/C	y	L
2	2	R1 N/O	y	U or L
		D & R2* N/C & D No. 2 N/O	y	U
4	4	No. 1 N/O & D & R2A* N/O	y	U
		No. 1 N/C & R2 N/O & R2A* N/C	y	L
		D & R1* N/C & D & No. 2 N/O	y	U
8	8	D & No. 2 N/O	y	U
		D & R2A N/O & No. 2 N/C	y	L
A	A	T1 N/O	y	U or L
B	B	T2 N/O	y	U or L
CK	CK	D & CK* N/O & No. 2 N/C	y	L
		D & CK N/C & D & No. 2 N/O	y	U

NOTES:

1. Asterisked (*) rotate contacts are bottom right – all others are bottom left.

2. Circuits through N/O tilt, rotate, and no. 1 and no. 2 mode contacts indicate the the contact is transferred.

3. Circuits through N/C tilt, rotate, and no. 1 and no. 2 mode contacts indicate that the contact is not transferred.

BCD INPUT CODES

Input Mode (E.T. to line) Code Transmitted

CHARACTER	CASE	*BIT LINES PULSED 1	2	4	8	A	B	CK
■	U	0	0	0	0	0	0	0
A	L	1	0	0	0	0	1	1
■	U	0	0	0	0	0	0	0
B	L	0	1	0	0	0	1	1
■	U	0	0	0	0	0	0	0
C	L	1	1	0	0	0	1	1
■	U	0	0	0	0	0	0	0
D	L	0	0	1	0	0	1	1
■	U	0	0	0	0	0	0	0
E	L	1	0	1	0	0	1	1
■	U	0	0	0	0	0	0	0
F	L	0	1	1	0	0	1	1
?	U	0	1	0	1	0	1	1
G	L	1	1	1	0	0	1	0
¤	U	0	0	1	1	0	1	1
H	L	0	0	0	1	0	1	0
‾	U	1	0	1	1	0	1	0
I	L	1	0	0	1	0	1	1
■	U	0	0	0	0	0	0	0
J	L	1	0	0	0	0	1	0
■	U	0	0	0	0	0	0	0
K	L	0	1	0	0	0	1	1
■	U	0	0	0	0	0	0	0
L	L	1	1	0	0	0	1	0	1
■	U	0	0	0	0	0	0	0
M	L	0	0	1	0	0	1	1
■	U	0	0	0	0	0	0	0
N	L	1	0	1	0	0	1	0
■	U	0	0	0	0	0	0	0
O	L	0	1	1	0	0	1	0
¯	U	0	1	0	1	0	1	0
P	L	1	1	1	0	0	1	1
※	U	0	0	1	1	0	1	0
Q	L	0	0	0	1	0	1	1
⌋	U	1	0	1	1	0	1	1
R	L	1	0	0	1	0	1	0
■	U	0	0	0	0	0	0	0
S	L	0	1	0	0	1	0	1
■	U	0	0	0	0	0	0	0
T	L	1	1	0	0	1	0	0
■	U	0	0	0	0	0	0	0
U	L	0	0	1	0	1	0	1
■	U	0	0	0	0	0	0	0
V	L	1	0	1	0	1	0	0
■	U	0	0	0	0	0	0	0
W	L	0	1	1	0	1	0	0
*	U	0	1	0	1	1	0	0
X	L	1	1	1	0	1	0	1
%	U	0	0	1	1	1	0	0
Y	L	0	0	0	1	1	0	1
{	U	1	0	1	1	1	0	1
Z	L	1	0	0	1	1	0	0
■	U	0	0	0	0	0	0	0
1	L	1	0	0	0	0	0	0
■	U	0	0	0	0	0	0	0
2	L	0	1	0	0	0	0	0
■	U	0	1	0	0	0	0	0
3	L	1	1	0	0	0	0	1
■	U	0	0	0	0	0	0	0
4	L	0	0	1	0	0	0	0
■	U	0	0	0	0	0	0	0
5	L	1	0	1	0	0	0	1
■	U	0	0	0	0	0	0	0
6	L	0	1	1	0	0	0	1
■	U	0	0	0	0	0	0	0
7	L	1	1	1	0	0	0	0
@	U	0	0	0	1	0	0	1
8	L	0	0	0	1	0	0	0
:	U	1	0	1	1	0	0	0
9	L	1	0	0	1	0	0	1
>	U	0	1	1	1	0	0	0
0	L	0	1	0	1	0	0	1
;	U	0	1	1	1	0	1	1
_	L	0	0	0	0	0	1	0
√	U	1	1	1	1	0	0	1
#	L	1	1	0	1	0	0	0
/	U	0	1	1	1	1	0	1
ъ	L	0	0	0	0	1	0	0
<	U	0	1	1	1	1	0	0
&	L	0	0	0	0	1	1	1
△	U	1	1	1	1	1	0	0
$	L	1	1	0	1	0	1	1
#	U	1	1	1	1	1	0	1
,	L	1	1	0	1	1	0	1
*	U	1	1	1	1	1	1	1
.	L	1	1	0	1	1	1	0
■	U	0	0	0	0	0	0	0
/	L	1	0	0	0	1	0	1

BCD OUTPUT CODES

Output Mode (Line to E.T.) Code Received

CHARACTER	CASE	MAGNETS PULSED R1	R2	R2A	R-5	T1	T2	CK
■	U	0	0	0	0	0	0	0
A	L	1	1	1	1	0	0	1
■	U	0	0	0	0	0	0	0
B	L	0	1	1	0	0	0	1
■	U	0	0	0	0	0	0	0
C	L	0	1	1	1	0	0	0
■	U	0	0	0	0	0	0	0
D	L	1	0	1	0	0	0	1
■	U	0	0	0	0	0	0	0
E	L	1	0	1	1	0	0	0
■	U	0	0	0	0	0	0	0
F	L	0	0	1	0	0	0	0
?	U	0	0	1	1	0	0	1
G	L	0	0	1	1	0	0	1
¤	U	1	0	0	1	0	0	1
H	L	1	0	0	1	0	0	1
‾	U	1	0	0	0	0	0	0
I	L	1	0	0	0	0	0	0
■	U	0	0	0	0	0	0	0
J	L	1	1	1	1	1	0	0
■	U	0	0	0	0	0	0	0
K	L	0	1	1	0	1	0	0
■	U	0	0	0	0	0	0	0
L	L	0	0	1	1	1	0	1
■	U	0	0	0	0	0	0	0
M	L	1	0	1	0	1	0	0
■	U	0	0	0	0	0	0	0
N	L	1	0	1	1	1	0	1
■	U	0	0	0	0	0	0	0
O	L	0	0	1	0	1	0	1
¯	U	0	0	1	1	1	0	0
P	L	0	0	1	1	1	0	0
※	U	1	0	0	1	1	0	0
Q	L	1	0	0	1	1	0	0
⌋	U	1	0	0	0	1	0	1
R	L	1	0	0	0	1	0	1
■	U	0	0	0	0	0	0	0
S	L	0	1	1	0	0	1	0
■	U	0	0	0	0	0	0	0
T	L	0	1	1	1	0	1	1
■	U	0	0	0	0	0	0	0
U	L	1	0	1	0	0	1	0
■	U	0	0	0	0	0	0	0
V	L	1	0	1	1	0	1	1
■	U	0	0	0	0	0	0	0
W	L	0	0	1	0	0	1	1
*	U	0	0	1	1	0	1	0
X	L	0	0	1	1	0	1	0
%	U	1	0	0	1	0	1	0
Y	L	1	0	0	1	0	1	0
{	U	1	0	0	0	0	1	1
Z	L	1	0	0	0	0	1	1
■	U	0	0	0	0	0	0	0
1	L	1	1	1	1	1	1	1
■	U	0	0	0	0	0	0	0
2	L	0	1	1	1	1	1	1
■	U	0	0	0	0	0	0	0
3	L	0	1	1	1	1	1	0
■	U	0	0	0	0	0	0	0
4	L	1	0	1	0	1	1	1
■	U	0	0	0	0	0	0	0
5	L	1	0	1	1	1	1	0
■	U	0	0	0	0	0	0	0
6	L	0	0	1	0	1	1	0
■	U	0	0	0	0	0	0	0
7	L	0	0	1	1	1	1	1
@	U	1	0	0	1	1	1	1
8	L	1	0	0	1	1	1	1
:	U	1	0	0	0	1	1	0
9	L	1	0	0	0	1	1	0
>	U	0	0	0	1	1	1	0
0	L	0	0	0	1	1	1	0
;	U	1	1	1	1	0	1	0
_	L	1	1	1	1	0	1	1
√	U	0	0	0	0	1	1	1
#	L	0	0	0	0	1	1	1
/	U	1	1	1	0	0	1	1
ъ	L	1	1	1	0	0	1	1
<	U	1	1	1	0	0	0	0
&	L	1	1	1	0	0	0	0
△	U	0	0	0	0	1	0	0
$	L	0	0	0	0	1	0	0
#	U	0	0	0	0	0	1	0
,	L	0	0	0	0	0	1	0
*	U	0	0	0	0	0	0	1
.	L	0	0	0	0	0	0	1
■	U	0	0	0	0	0	0	0
/	L	1	1	1	1	0	1	0

NOTES:

■ **Selecting upper case type element positions where a black square (pillow) appears will generate an invalid code, and will cause a pillow to be printed. The parity check may appear either odd or even.**

* Bits are formed by contact closure (print selection transmitting and shift mode) between terminal "Y" and the bit lines (see BCD Wiring Diagram, page 116).

SELECTION AND TILT-ROTATE SCHEDULE

BCD KEYBOARD											CORRESPONDENCE KEYBOARD										
UC	LC	T2	CK	T1	R2A	R1	R2	R5	TLT	ROT	UC	LC	T2	CK	T1	R2A	R1	R2	R5	TLT	ROT
■	A	X		X				X	3	-5	A	a	X	X			X	X	X	2	-2
■	B	X		X		X			3	+1	B	b		X	X	X	X	X		1	+5
■	C	X	X	X		X		X	3	-4	C	c		X	X		X	X	X	1	-2
■	D	X		X			X		3	+2	D	d		X				X	X	1	-3
■	E	X	X	X			X	X	3	-3	E	e		X	X			X		1	+2
■	F	X	X	X		X	X		3	+3	F	f	X	X	X		X		X	3	-4
?	G	X		X		X	X	X	3	-2	G	g	X		X				X	3	-5
¤	H	X		X	X		X	X	3	-1	H	h			X	X		X		1	+4
¢	I	X	X	X	X		X		3	+4	I	i	X				X	X		2	+3
■	J	X	X					X	2	-5	J	j	X	X	X					3	0
■	K	X	X			X			2	+1	K	k			X		X	X		1	+3
■	L	X				X		X	2	-4	L	l		X	X	X		X	X	1	-1
■	M	X	X				X		2	+2	M	m	X	X					X	2	-5
■	N	X					X	X	2	-3	N	n		X	X		X			1	+1
■	O	X				X	X		2	+3	O	o	X	X		X		X	X	2	-1
!	P	X	X			X	X	X	2	-2	P	p	X		X			X		3	+2
⁘	Q	X	X		X		X	X	2	-1	Q	q	X	X	X		X	X		3	+3
]	R	X			X		X		2	+4	R	r	X					X	X	2	-3
■	S		X	X		X			1	+1	S	s	X			X		X		2	+4
■	T			X		X		X	1	-4	T	t			X					1	0
■	U		X	X			X		1	+2	U	u			X		X		X	1	-4
■	V			X			X	X	1	-3	V	v	X				X		X	2	-4
■	W			X		X	X		1	+3	W	w	X	X		X	X	X		2	+5
÷	X		X	X		X	X	X	1	-2	X	x		X	X				X	1	-5
%	Y		X	X	X		X	X	1	-1	Y	y	X	X	X	X		X		3	+4
⁀	Z			X	X		X		1	+4	Z	z		X						0	0
■	1							X	0	-5	[	]							X	0	-5
■	2					X			0	+1	@	2					X			0	+1
■	3		X			X		X	0	-4	#	3		X			X		X	0	-4
■	4						X		0	+2	$	4				X		X	X	0	-1
■	5		X				X	X	0	-3	%	5						X		0	+2
■	6		X			X	X		0	+3	¢	6		X			X	X		0	+3
■	7					X	X	X	0	-2	&	7		X				X	X	0	-3
@	8				X		X	X	0	-1	*	8					X	X	X	0	-2
:	9		X		X			X	0	+4	(	9				X	X	X		0	+5
>	0		X		X	X	X	X	0	0	)	0		X		X		X		0	+4
'	-	X							2	0	_	-	X		X	X	X	X		3	+5
√	#					X	X	X	0	+5	+	=	X		X		X			3	+1
¯	5			X					1	0	°	1	X							2	0
<	&	X	X	X					3	0	:	;	X	X	X			X	X	3	-3
Δ	$	X	X		X	X	X		2	+5	"	'	X	X				X		2	+2
⁗	,		X	X	X	X	X		1	+5	,	,	X		X		X	X	X	3	-2
⁝	.	X		X	X	X	X		3	+5	.	.	X	X			X			2	+1
■	/		X	X				X	1	-5	?	/	X		X	X		X	X	3	-1

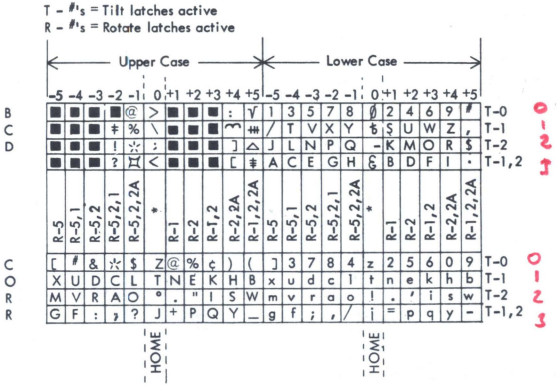
X in Square* — Indicates; 1. Selection Contact Transferred
2. Latches Active

Blank Square* — Indicates Selection Magnet Energized

*Exception — X in R5 Column Indicates Both Selection Contact Transferred and Magnet Energized.

TYPEHEAD LAYOUT

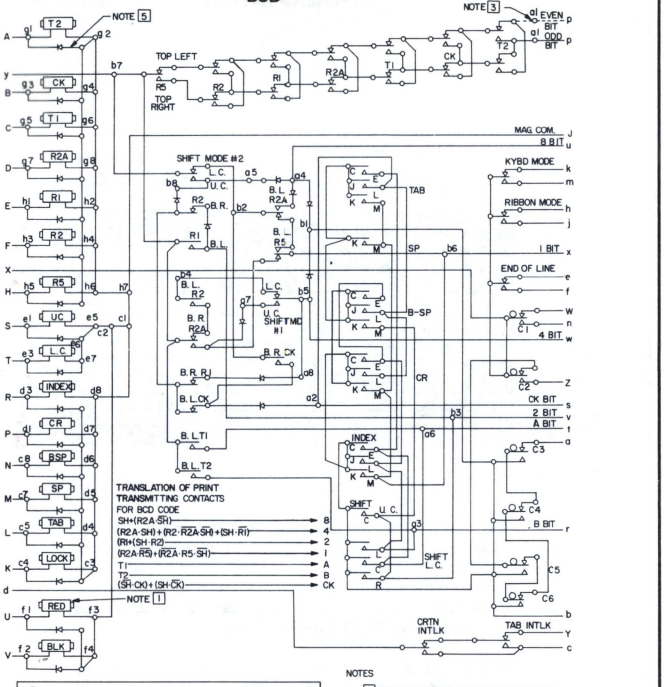
T - #'s = Tilt latches active
R - #'s = Rotate latches active



*With one exception, home position (Zero Rotate) selection on the 73 Series is identical to the 72 Series — i.e., no rotate latches are active. On the BCD machine, home position, during zero tilt only (ϕ & >), is selected by the cancellation method — i.e., all rotate latches are active (see the Selection and Tilt Rotate Schedule).

On the BCD machine only, the symbol > (Greater Than) may be used to check typehead homing.

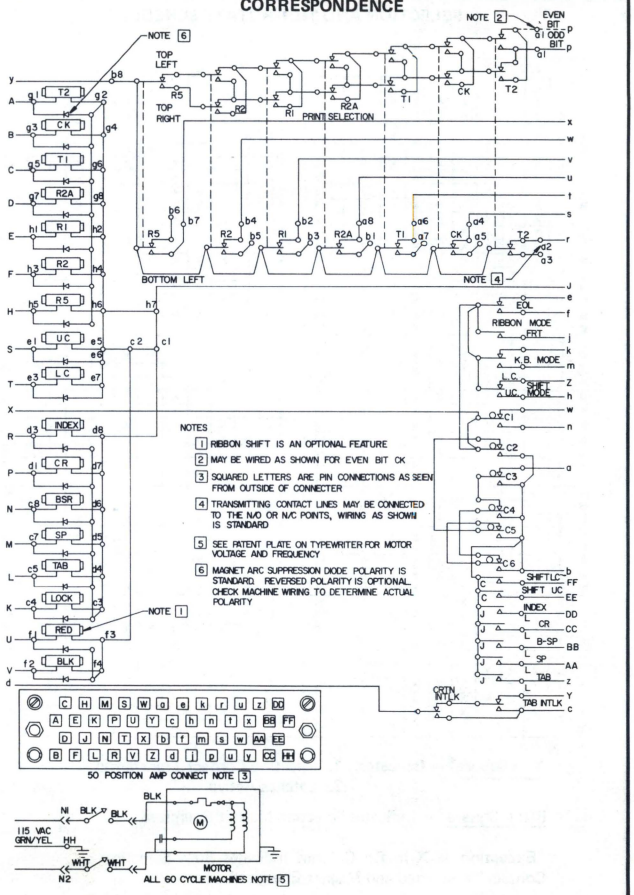
BCD



NOTES

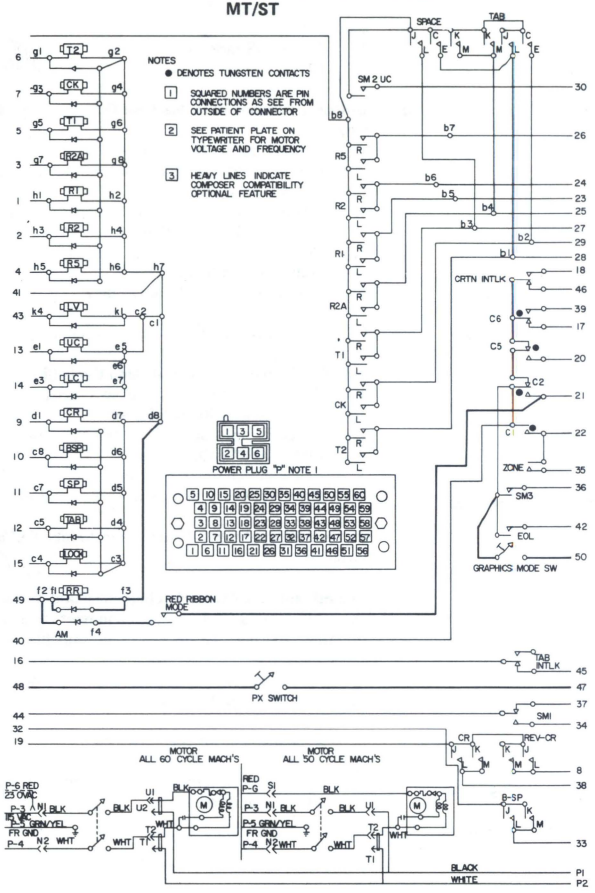
1. RIBBON SHIFT IS AN OPTIONAL FEATURE
2. SQUARED LETTERS ARE PIN CONNECTIONS AS SEEN FROM OUTSIDE OF CONNECTOR
3. MAY BE WIRED AS SHOWN FOR EVEN BIT CHECK
4. SEE PATENT PLATE ON TYPEWRITER FOR MOTOR VOLTAGE AND FREQUENCY
5. MAGNET ARC SUPPRESSION DIODE POLARITY AS SHOWN IS STANDARD. REVERSED POLARITY IS OPTIONAL. CHECK MACHINE WIRING TO DETERMINE ACTUAL POLARITY

CORRESPONDENCE



NOTES

1. RIBBON SHIFT IS AN OPTIONAL FEATURE
2. MAY BE WIRED AS SHOWN FOR EVEN BIT CK
3. SQUARED LETTERS ARE PIN CONNECTIONS AS SEEN FROM OUTSIDE OF CONNECTER
4. TRANSMITTING CONTACT LINES MAY BE CONNECTED TO THE N/O OR N/C POINTS, WIRING AS SHOWN IS STANDARD
5. SEE PATENT PLATE ON TYPEWRITER FOR MOTOR VOLTAGE AND FREQUENCY
6. MAGNET ARC SUPPRESSION DIODE POLARITY IS STANDARD. REVERSED POLARITY IS OPTIONAL. CHECK MACHINE WIRING TO DETERMINE ACTUAL POLARITY



BROKEN TAPES CHECK

Rotate Tapes

1. Rotate detent clearance
2. Roller on detent actuating lever
3. Print shaft timing
4. Shift interlock adjustments
5. Defective rotate arm and shift arm pulleys
6. Tape guide
7. Negative latch clearance insufficient
8. Latch links: too long/too short
9. Popping latches
10. Latch angle
11. Interference between tilt and rotate pulleys
12. Broken or sticking rotate spring
13. Binding type element
14. Shift arm/cord tension pulley bracket or carrier return interlock contact shield
15. Chips in rotate pulley

Tilt Tape

1. Detent to tilt ring clearance
2. Burrs on tilt pulley
3. Binds in tilt ring
4. Sector gear
5. Print shaft timing
6. Tilt pulley spring (off or broken)
7. Interference between tilt and rotate pulleys
8. Loose detent follower
9. Tilt tape/carrier shoe eccentric stud

INSPECTION PROCEDURE

Suggested Procedure

A. Note operator's comments.
B. Power clean the printer with the covers removed.
C. Clean the feed rolls, platen, deflector, card-holder elements and exposed metal parts.
D. Lubrication
E. Machine Check
F. Clean Covers

Lubrication:

Lubrication should be applied only in quantities sufficient to lubricate the bearing areas immediately involved. In no case should lubrication be applied so freely as to cause migration or spin-off onto electrical or rubber components.

Machines with power on 24 hours daily require more frequent lubrication. The following areas are primarily affected by idling time, since only the operational shaft is being driven:

1. Motor
2. Cycle Clutch
3. Center Bearing
4. Operational Cam Bearings
5. Operational Shaft Support (15" Machines)
6. Operational Shaft Bearing
7. Shift Clutch

Since these machines are hot 24 hours a day, some lubricant evaporation can be expected in areas not driven during idling.

No. 10 Oil

1. All bearings, rollers, wick and pivot points
2. Motor (once each year)

No. 23 Grease

1. All cam surfaces
2. All sliding surfaces
3. Cycle clutch and shift clutch springs
4. Upper and lower ball sockets and ball joint
5. All latching surfaces
6. Feed roll pivots
7. Gear train

Do Not Lubricate

1. Nylon or nylatron parts except as noted
2. Electrical components

NOTE: To clean contacts, use bond paper saturated in IBM cleaning fluid or SMS card lubricant, followed by a strip of dry bond paper; do not burnish or file.

MACHINE CHECK

A. Remove Type Element

1. Look for a worn type element
2. Check upper ball socket play (horizontal and vertical)
3. Check tilt ring side play
4. Check carrier shoe clearance
5. Check carrier side play

B. Half-Cycle Neg. 5 No Tilt Character

1. Check rotate spring tension
2. Check tilt detent side play
3. Check tilt homing – correct any drift

C. Replace Type Element

1. Check rotate for binds (pull shift arm)
2. Check skirt clearance
3. Half-cycle WTORM – check detenting and rotate detent side play
4. Half-cycle WTOM (solid arm) – correct for any drift over .020" (0,51mm)
5. Check timing on M

D. Backspace

1. Check B/S rack free motion
2. Check carrier motion

E. Unlock Keyboard With Machine Off–Depress Center Keylever

1. Check filter shaft clearance
2. Check interposer travel after latching (.015" minimum) (0,38mm)
3. Check cycle clutch keeper clearance (.002"-.008") (0,05-0,20mm)
4. Check cycle clutch latch pawl overthrow and clutch latch bite on sleeve
5. Check cycle shaft end play (.001"-.003") (0,03-0,08mm)
6. Check cycle clutch spring for slippage

F. Trip The Carrier Return And Hand Cycle Slowly

1. Watch latch overthrow past keeper (.010"-.040") (0,25-1,02mm)
2. Check interposer restoring overthrow (.010"-.030") (0,25-0,76)
3. Check clutch unlatching link
4. Reset keyboard to lock when power is off

G. Be sure all applicable General and Safety CEMs are installed.

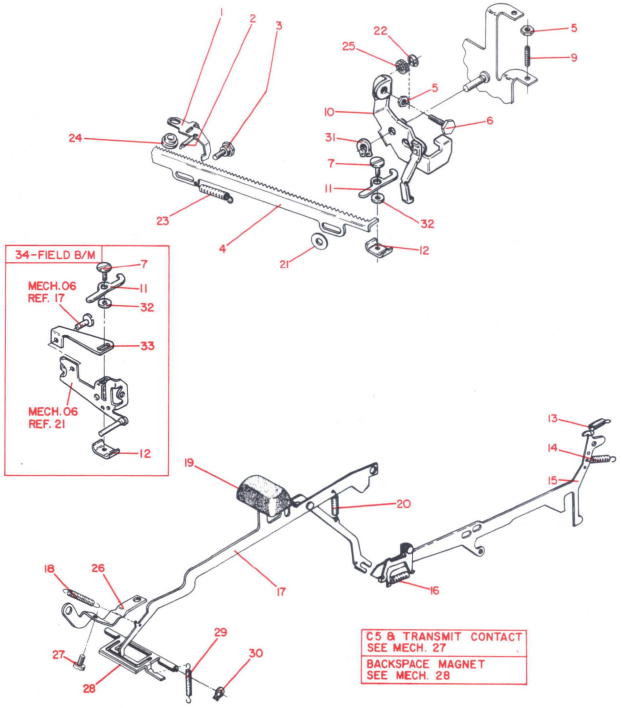
H. Record and playback all characters and functions; check for proper character alignment and check functions for positive operation without hestitation.

I. At least once each year all adjustments in the following areas should be checked:

1. Keyboard and Selection
2. Alignment, Print and Paper Feed
3. Escapement and Operational Mechanism
4. Electrical Mechanisms (magnets, contacts, switches and solenoids)

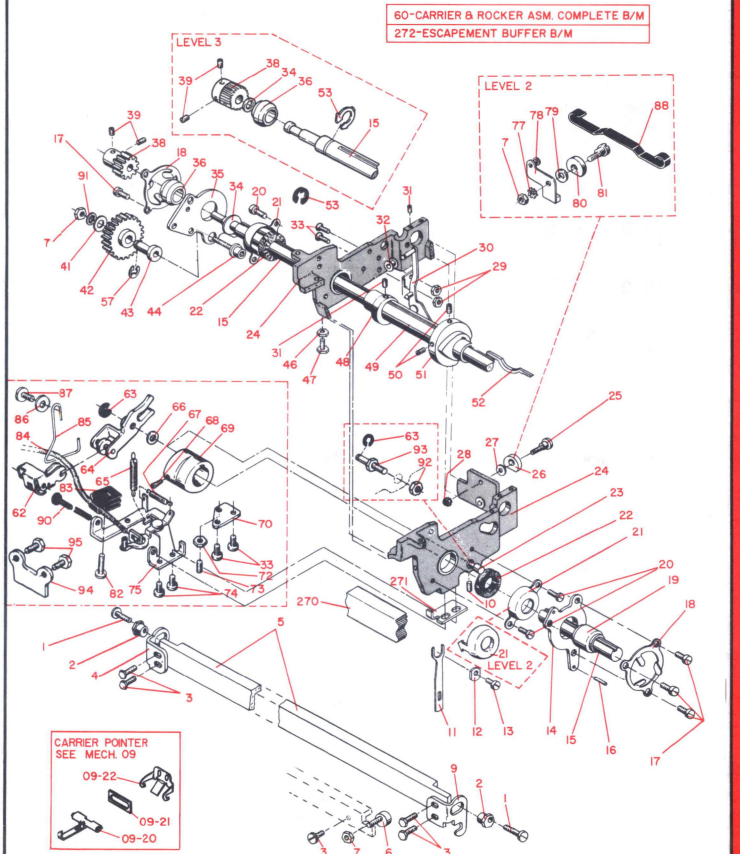
BACKSPACE

MECH. CODE 01



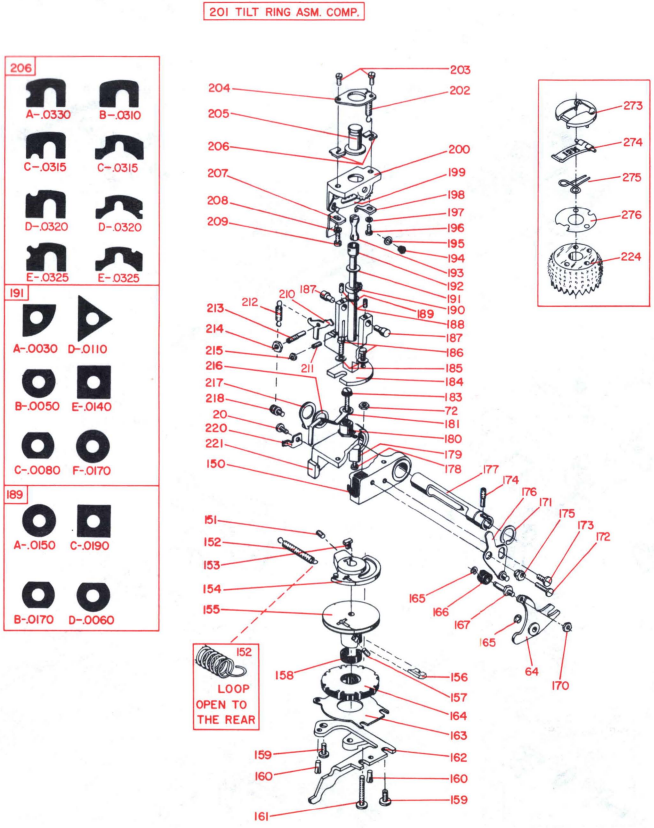
CARRIER

MECH. CODE 02



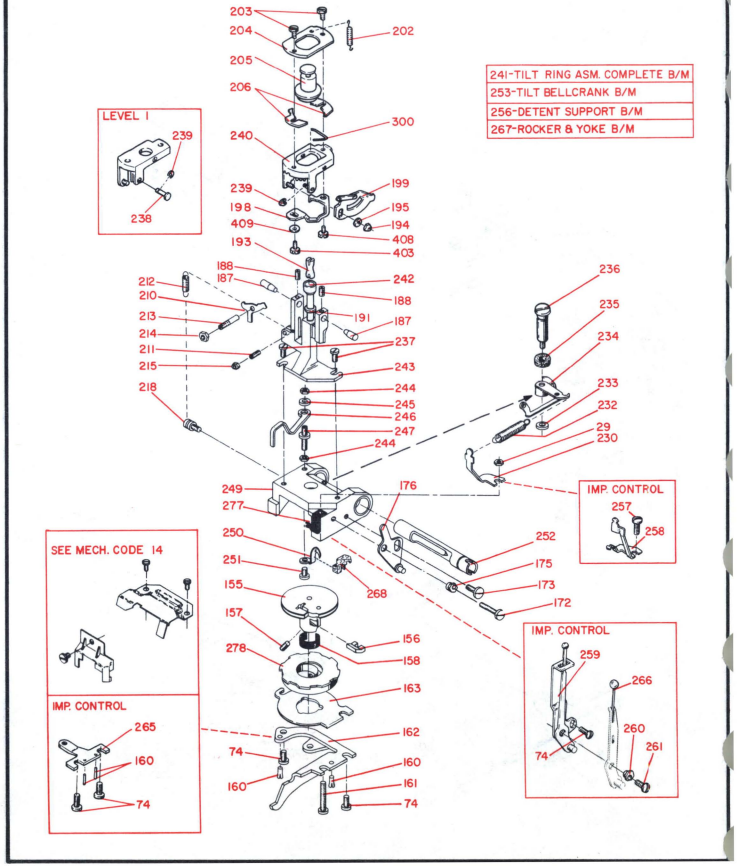
MECH. CODE 02

ROCKER
(GEAR TILT)



MECH. CODE 02

ROCKER
(GEARLESS TILT)

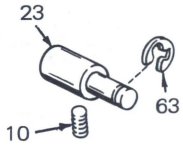


PRINT CAM FOLLOWER STUD

MECH. CODE 02

Pre-Dual Impression Machines

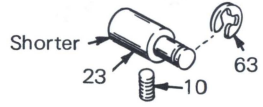
This stud, P/N 1124176, is used as a replacement part on all machines not equipped with dual impression which have the original "non-faced" carriers.



Early Dual Impression Machines

This stud, P/N 1175054, must be used on the early dual impression machines. The follower P/N 1141619, must also be replaced to ensure compatibility. This procedure is necessary because the early DI carriers were "non-faced." Note: Use washer, P/N 1164290, to reduce side play.

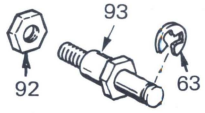
Part No.	Description
1175054	Stud, Fol. Mtg.



Pre-Dual Impression Machines With New Carrier

This stud, P/N 1164562, and nut, P/N 6503, must be used with a carrier change on all machines not equipped with dual impression. This is necessary because all field replacement carriers are "faced" and do not have a setscrew hole for mounting the original stud.

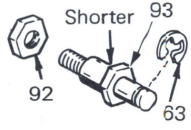
Part No.	Description
1164562	Stud, Fol. Mtg.
6503	Nut



Current Level Machines

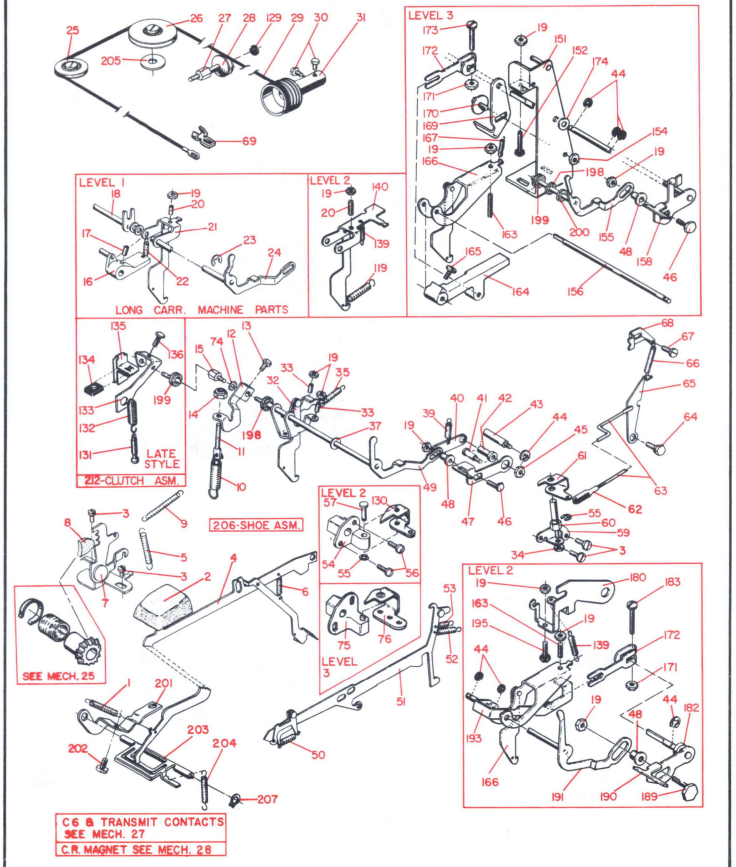
This stud, P/N 1164878, and nut, P/N 6503, can be used on all Dual Impression carriers that are "faced." It must be used with the new print cam follower, P/N 1141619.

Part No.	Description
1164878	Stud, Fol. Mtg.



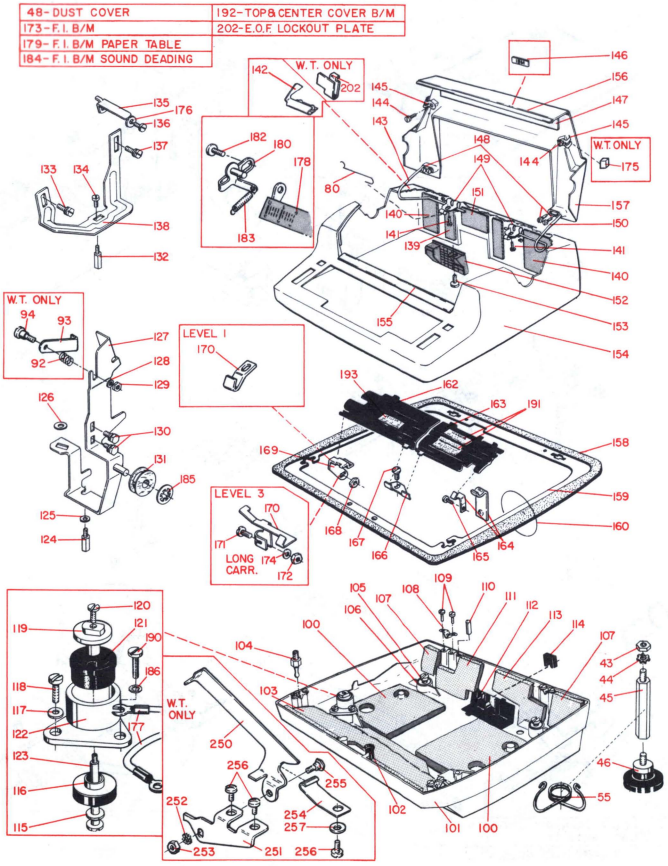
CARRIER RETURN

MECH. CODE 03



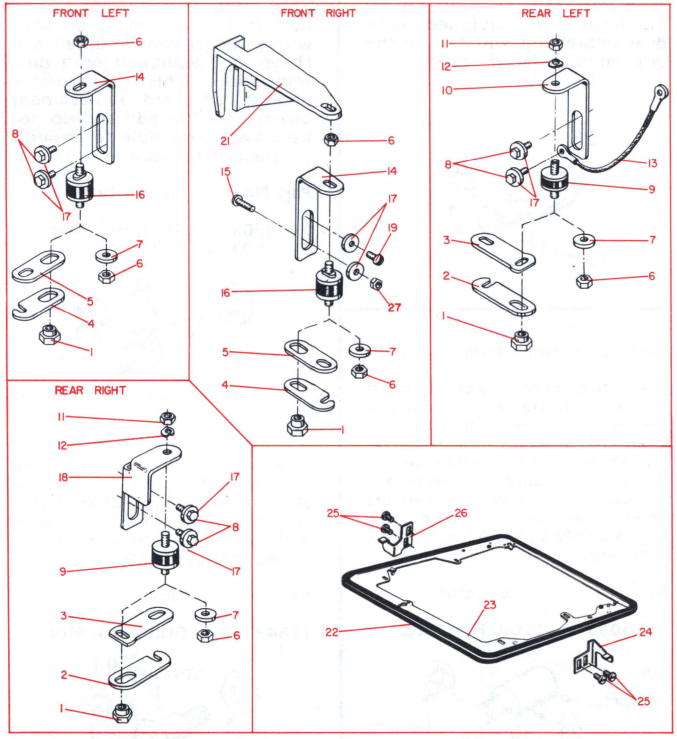
MECH. CODE 04

TILT UP COVERS



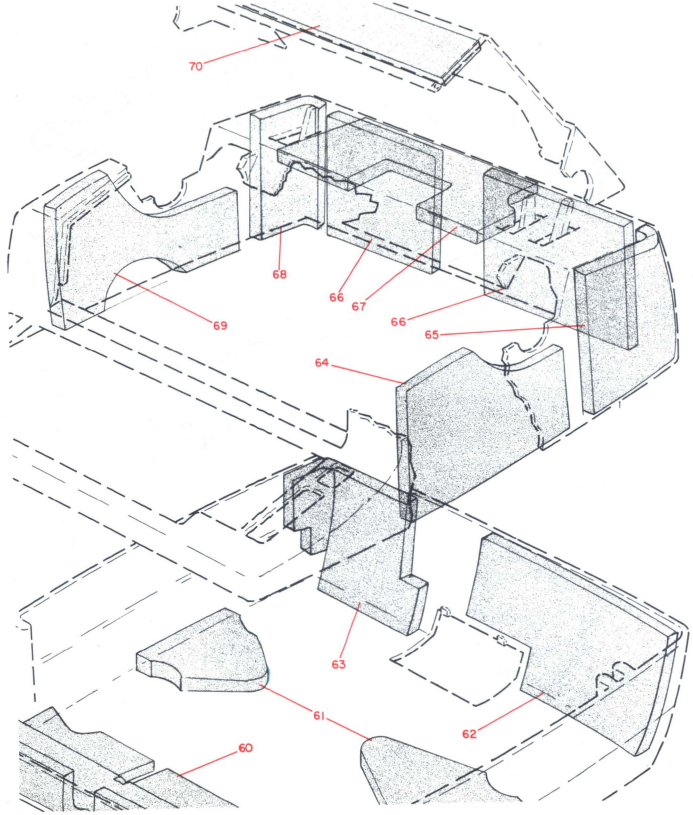
MECH. CODE 04

COVER MOUNTING



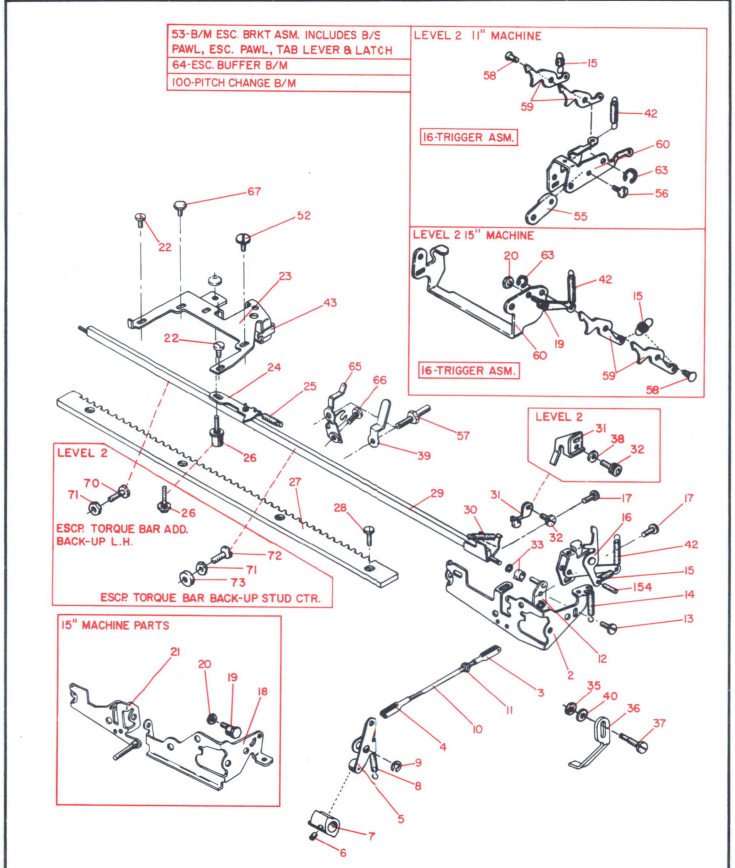
COVER INSULATION

MECH. CODE 04



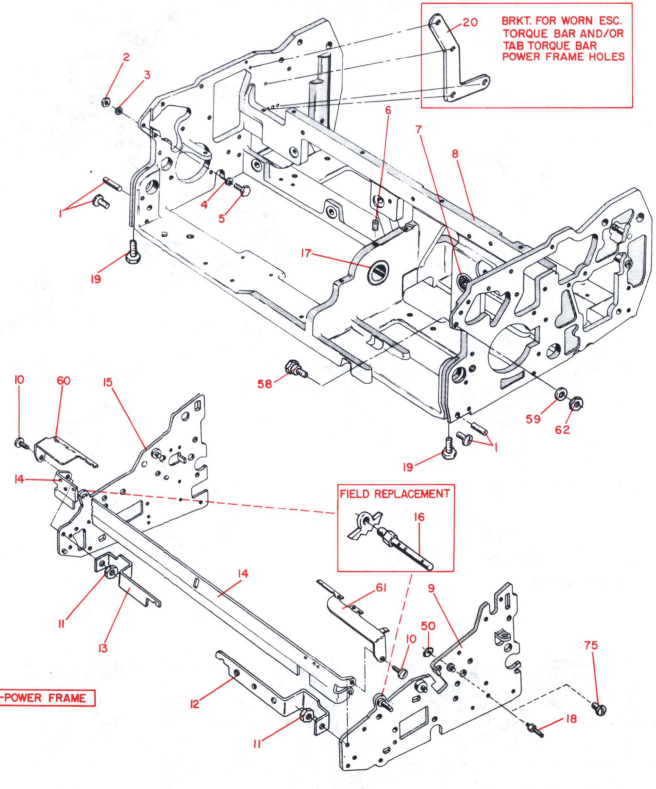
ESCAPEMENT

MECH. CODE 06



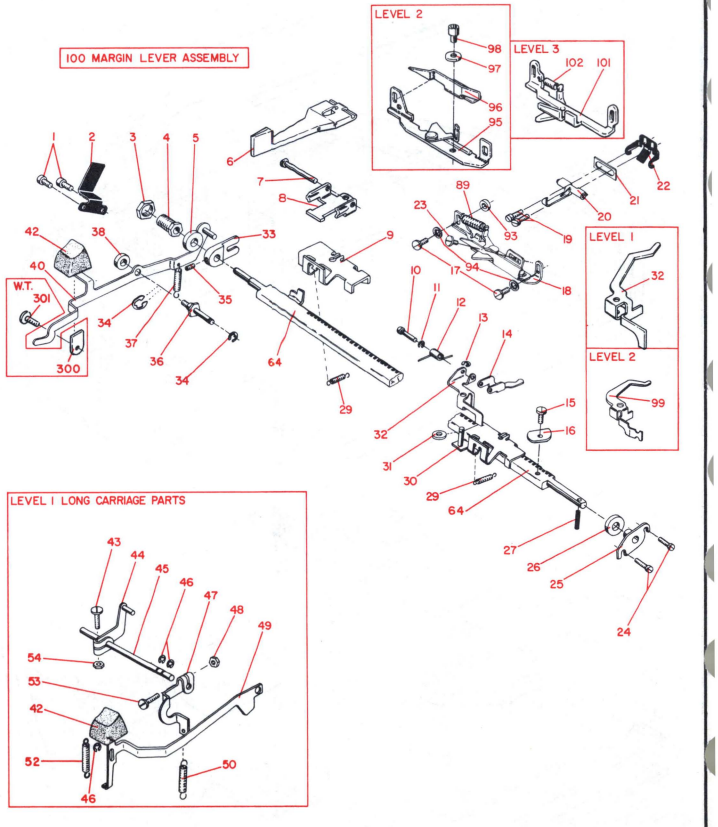
MECH. CODE 08

FRAMES



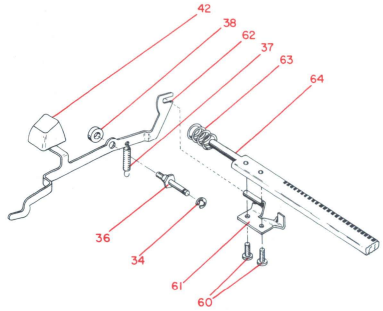
MECH. CODE 09

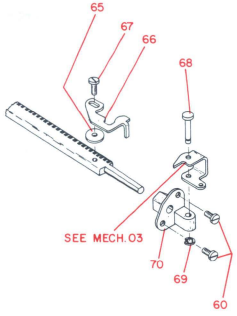
MARGINS

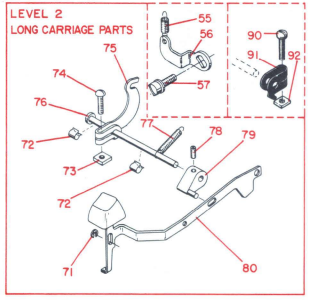


MARGINS

MECH. CODE 09

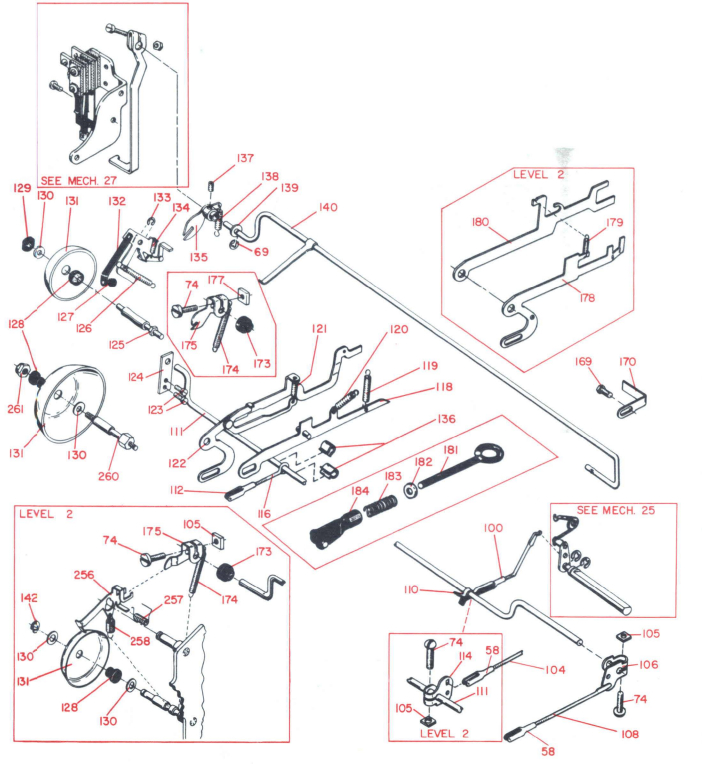






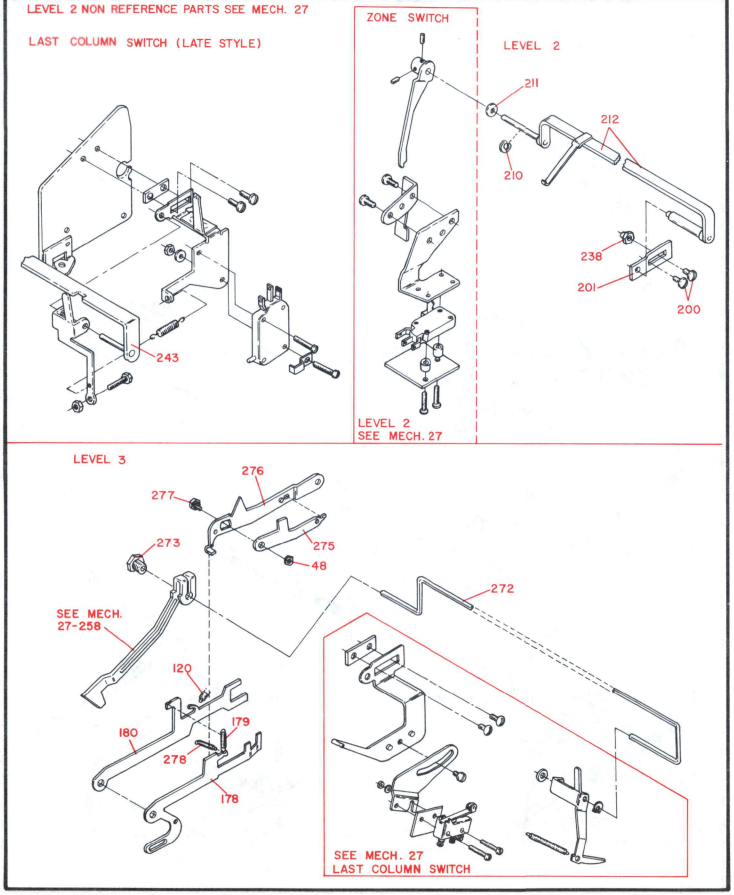
LINELOCK & BELL

MECH. CODE 09



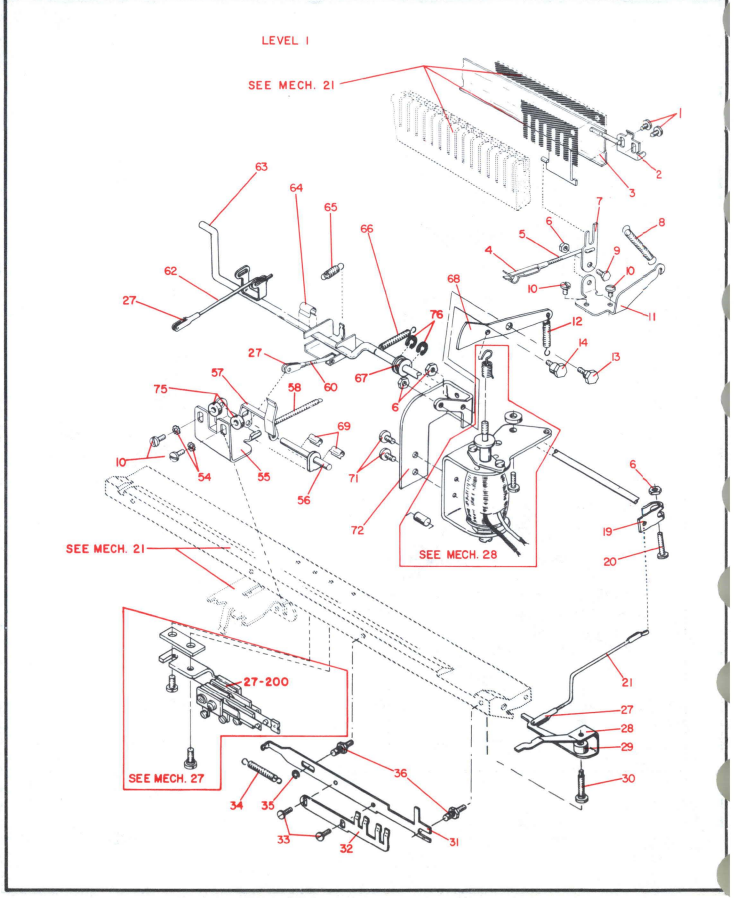
MECH. CODE 09

LINELOCK & BELL



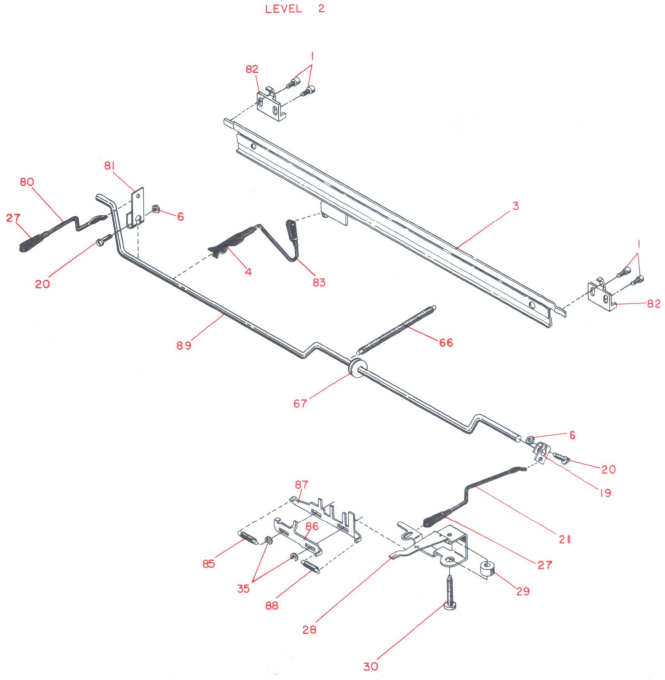
MECH. CODE 10

KEYBOARD LOCK



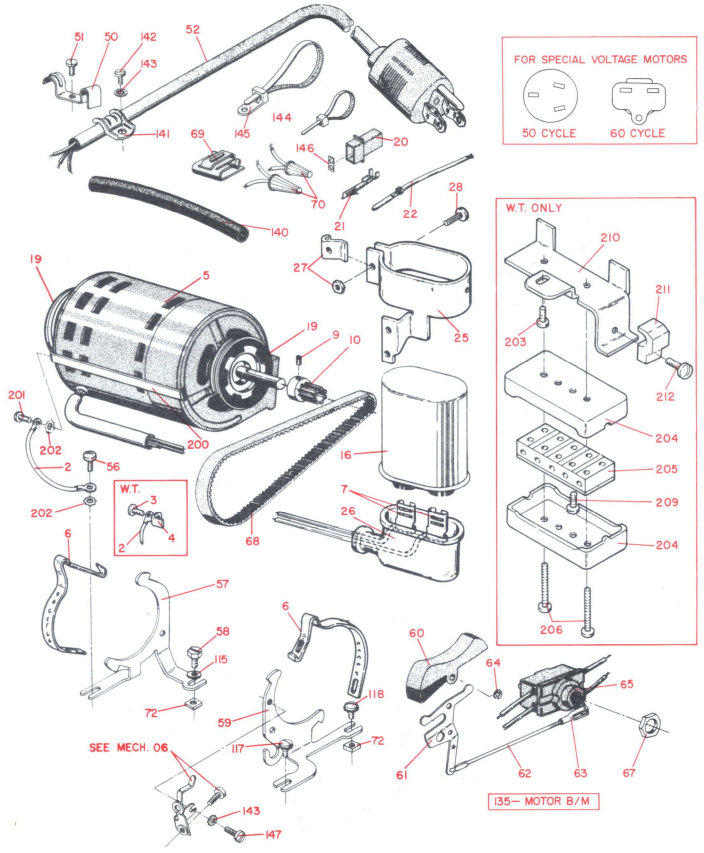
KEYBOARD LOCK

MECH. CODE 10



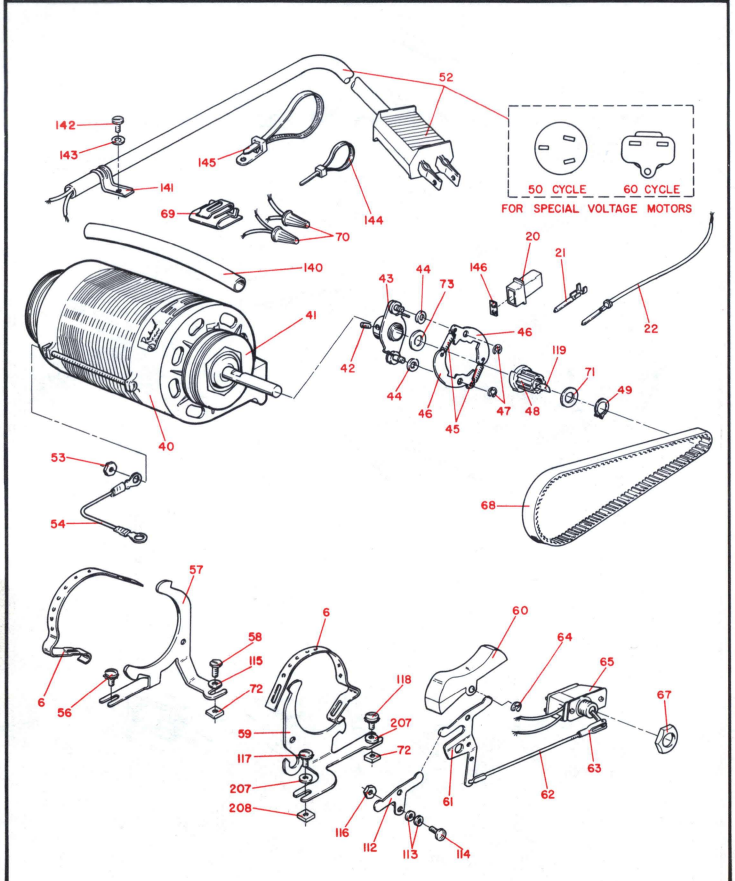
MOTOR & DRIVE

MECH. CODE 11



MECH. CODE 11

W.T. MOTOR & DRIVE



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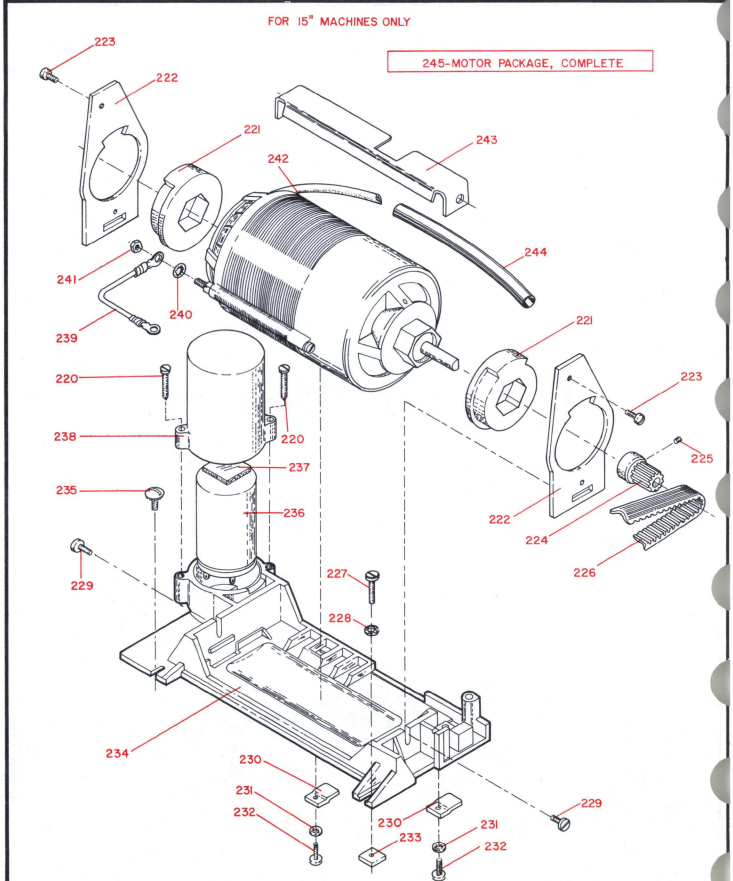
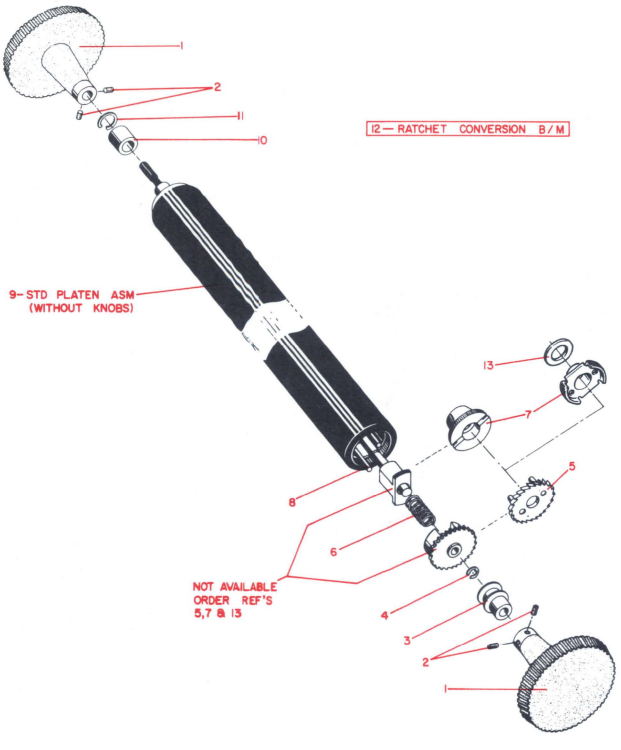
W.T. MOTOR & DRIVE



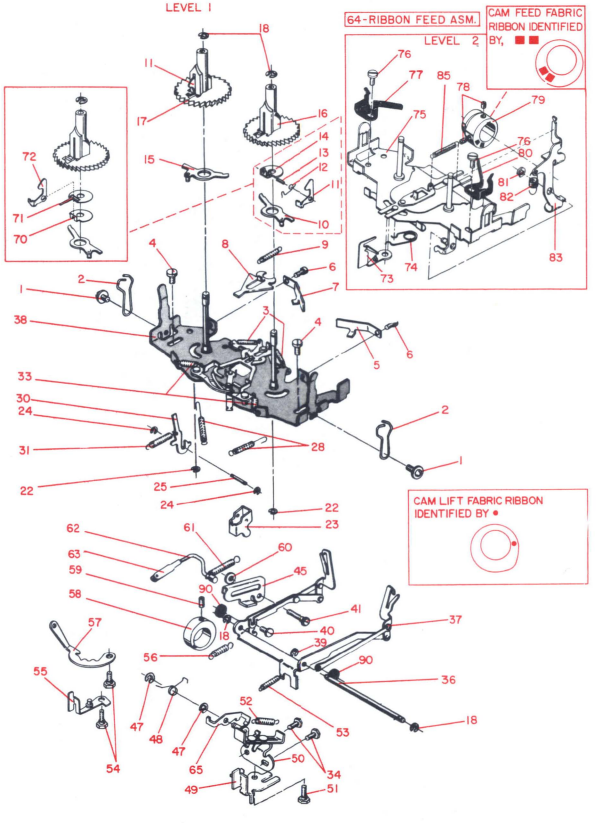
PLATEN

MECH. CODE 12



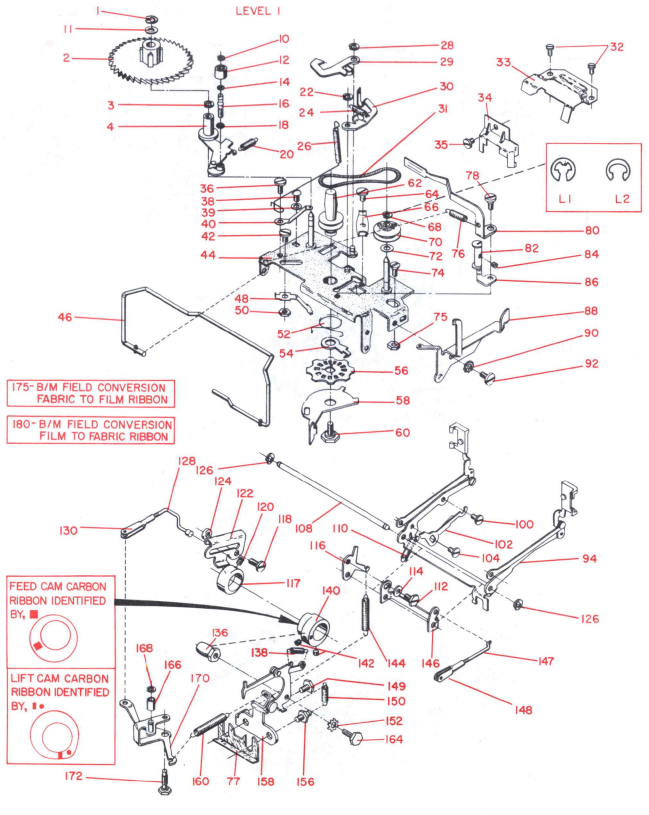
FABRIC RIBBON

MECH. CODE 13



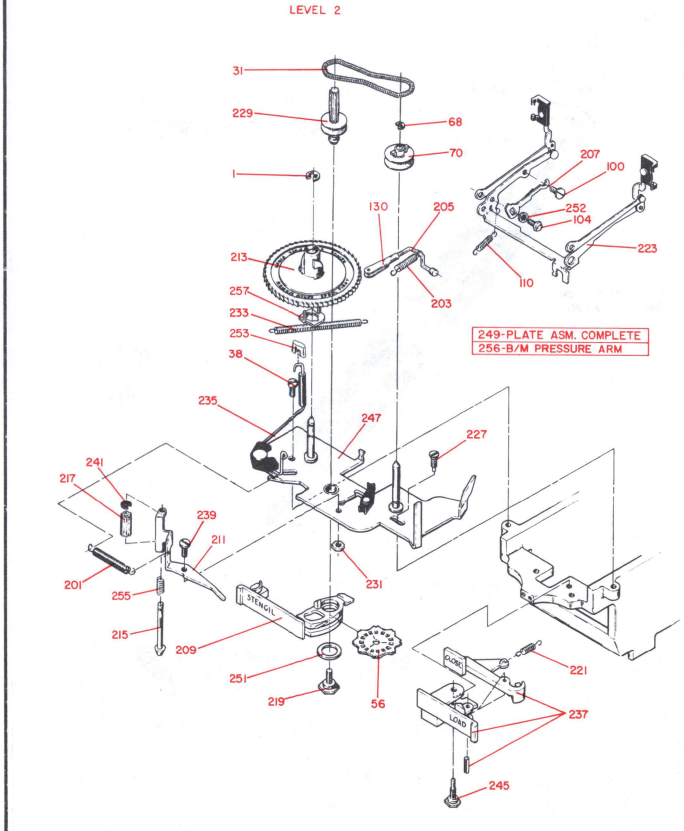
MECH. CODE 14

FILM RIBBON



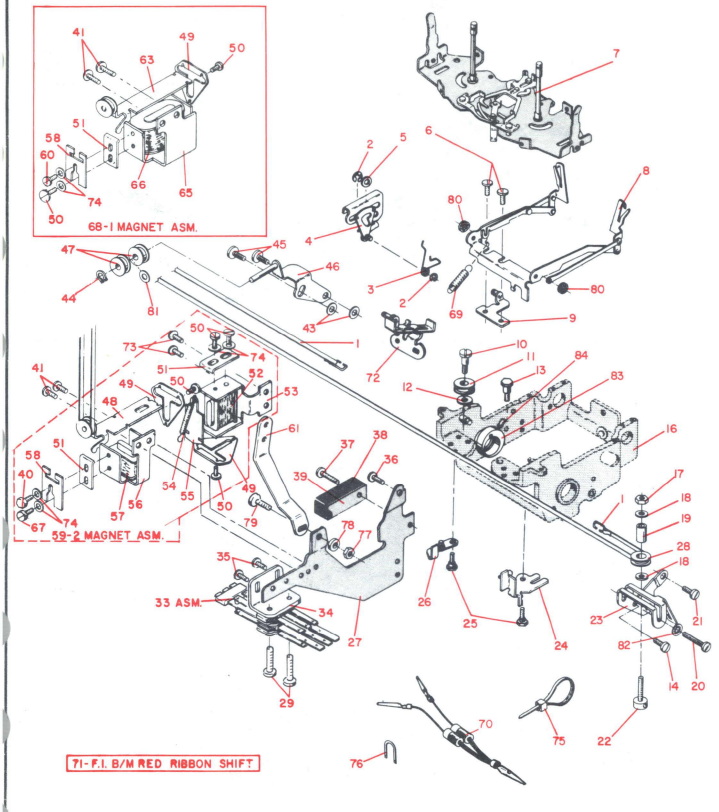
MECH. CODE 14

FILM RIBBON



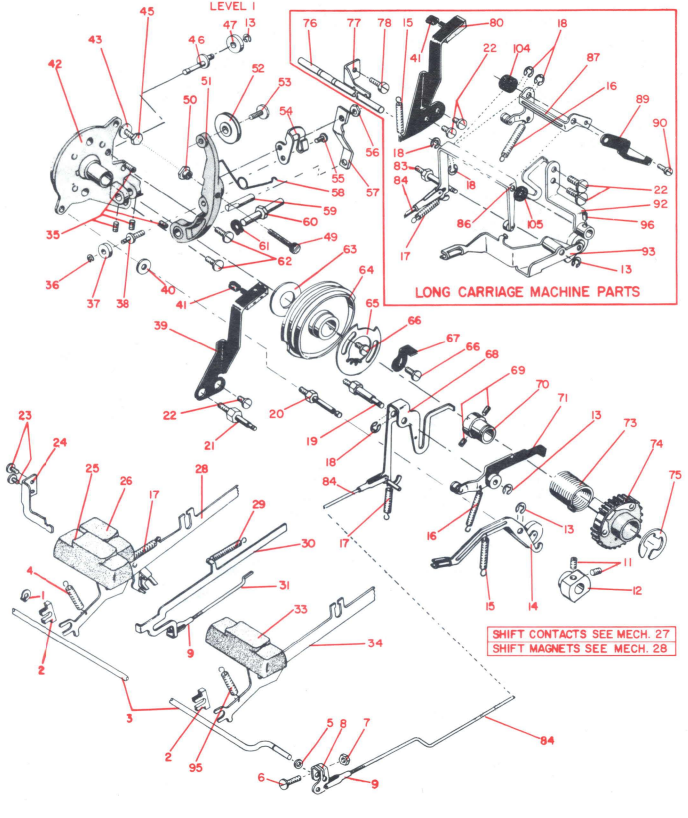
RED RIBBON SHIFT

MECH. CODE 15



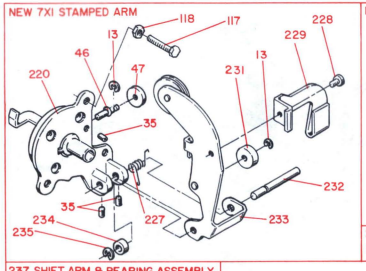
SHIFT

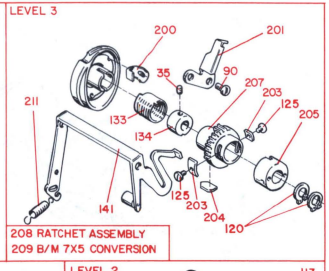
MECH. CODE 16



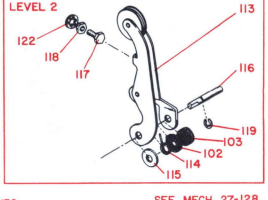
MECH. CODE 16

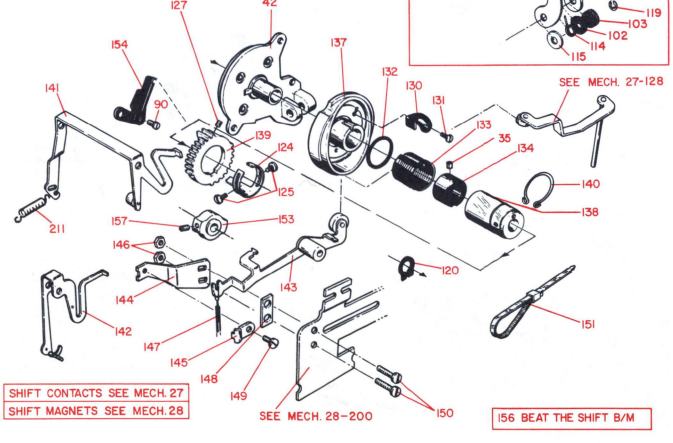
SHIFT





237 SHIFT ARM & BEARING ASSEMBLY



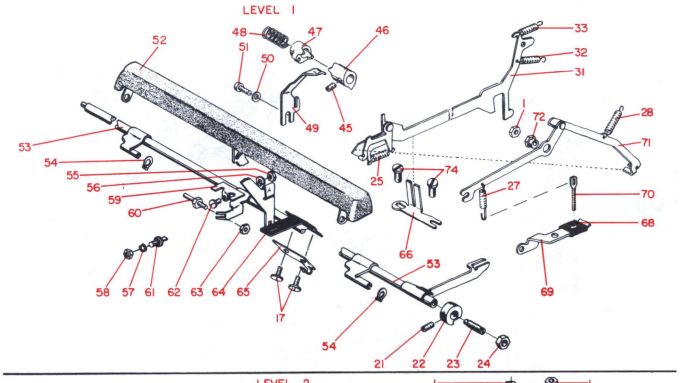


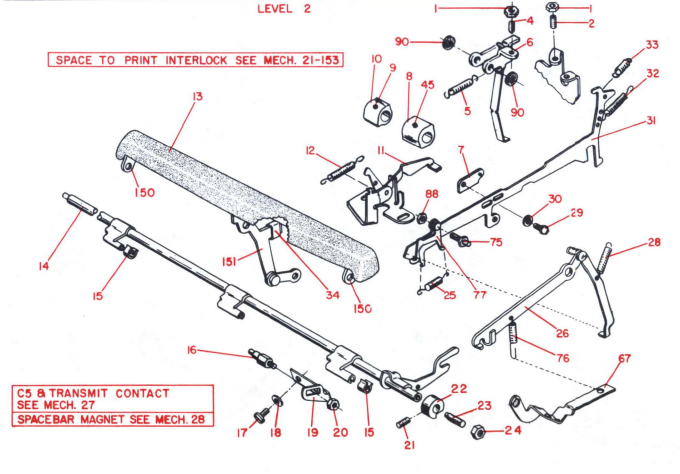
SHIFT CONTACTS SEE MECH. 27
SHIFT MAGNETS SEE MECH. 28

156 BEAT THE SHIFT B/M

MECH. CODE 17

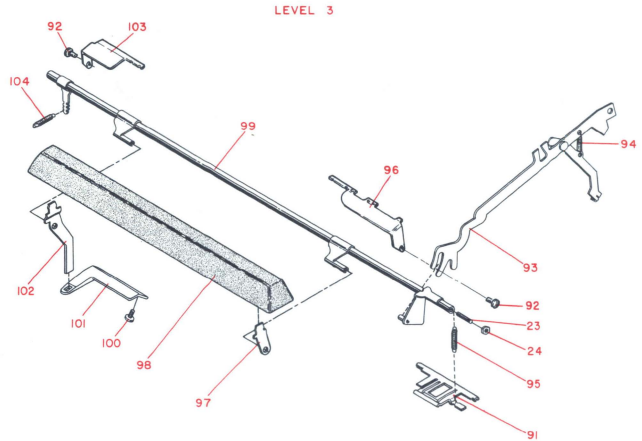
SPACEBAR





SPACEBAR

MECH. CODE 17

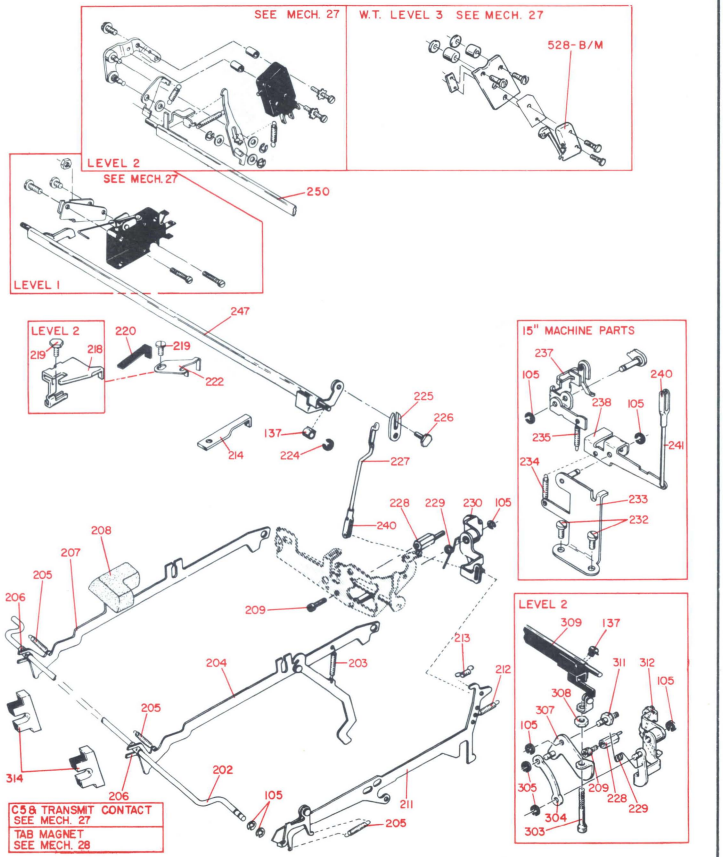


C5 & TRANSMIT CONTACT
SEE MECH. 27
SPACEBAR MAGNET
SEE MECH. 28

105-NO PRINT KEYLEVER

TAB

MECH. CODE 18



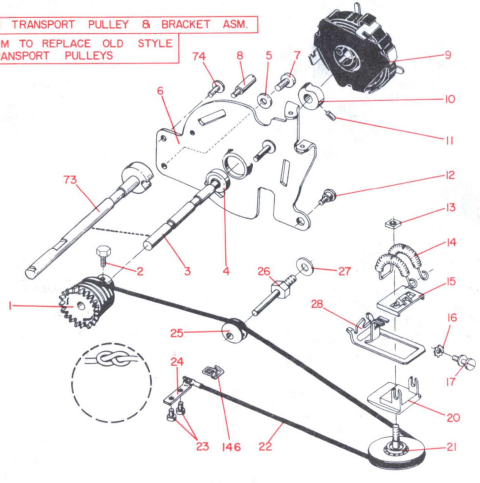
C5 & TRANSMIT CONTACT
SEE MECH. 27
TAB MAGNET
SEE MECH. 28

MECH. CODE **18**

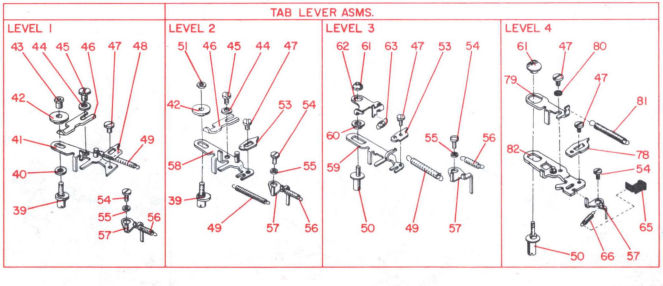
TAB

71 - RH TRANSPORT PULLEY & BRACKET ASM.

72 - B/M TO REPLACE OLD STYLE TRANSPORT PULLEYS

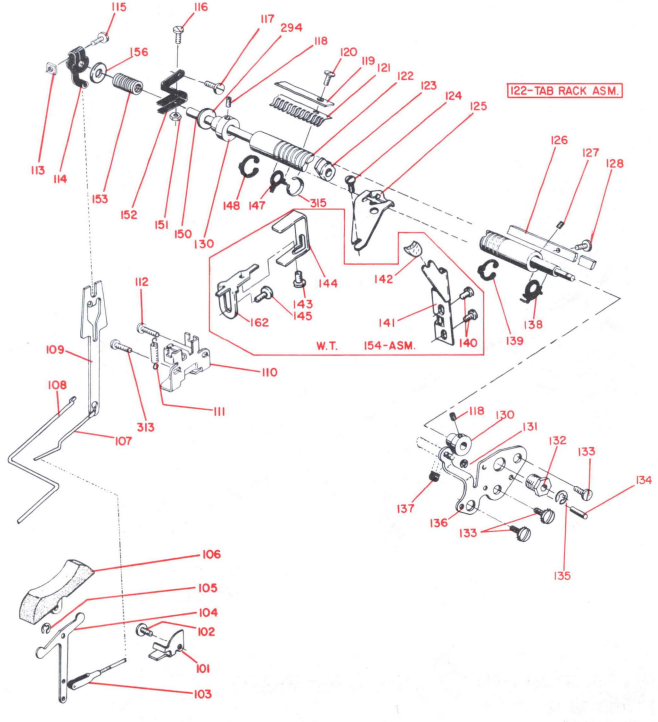


TAB LEVER ASMS.



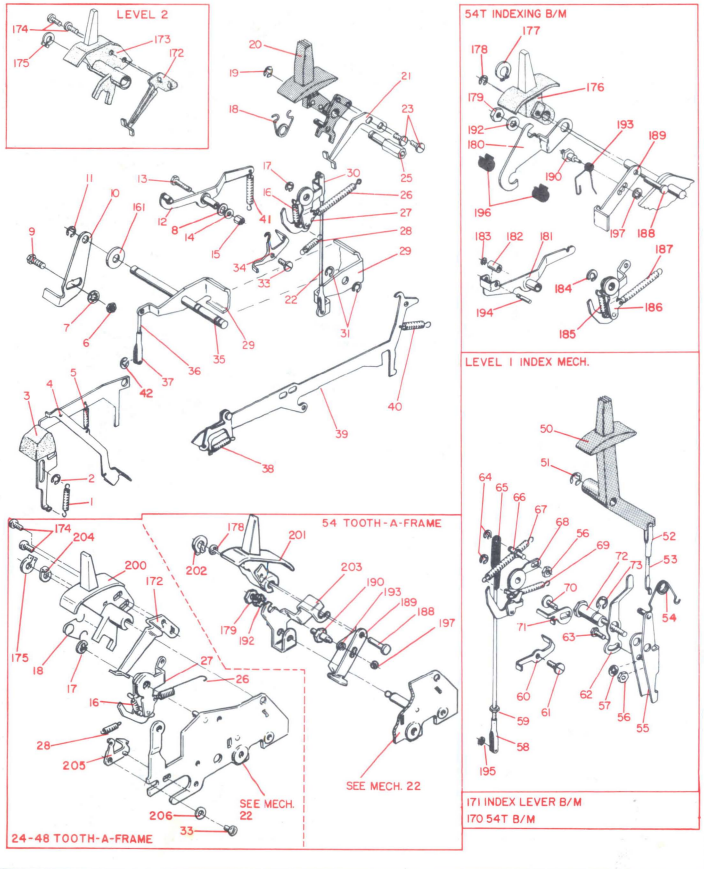
MECH. CODE **18**

TAB



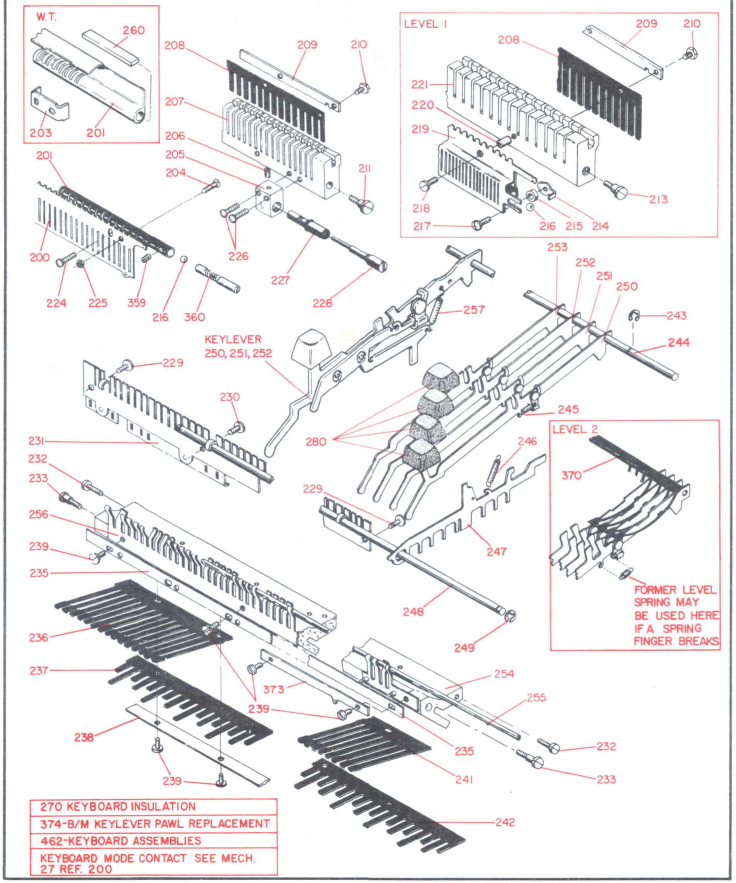
INDEX

MECH. CODE 20



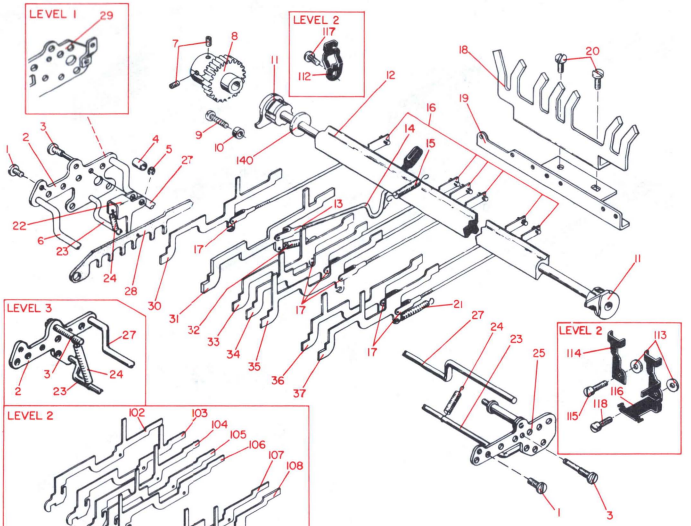
KEYBOARD SELECTION

MECH. CODE 21



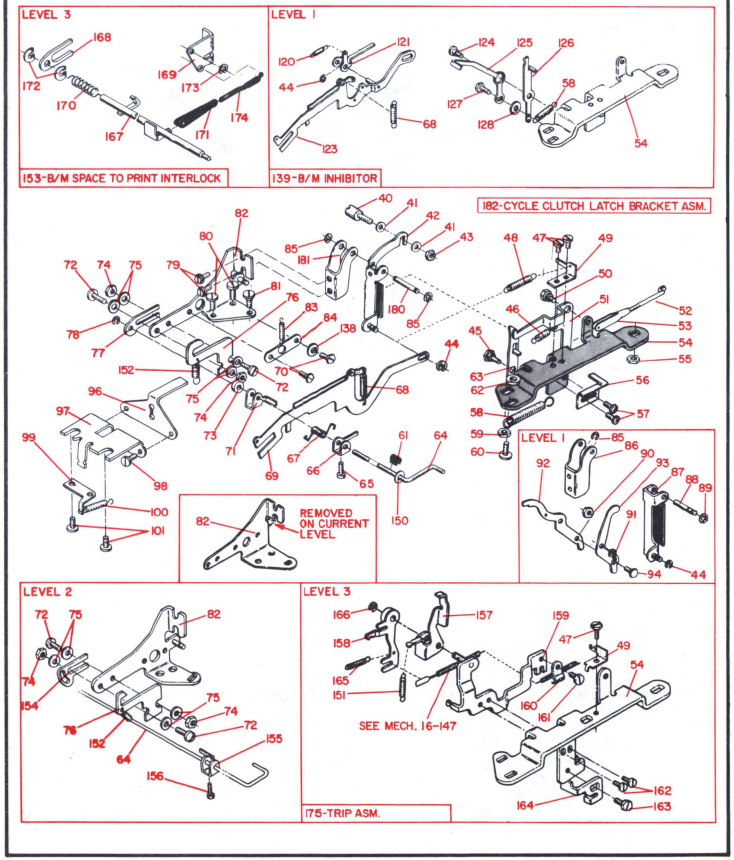
MECH. CODE 21

KEYBOARD SELECTION



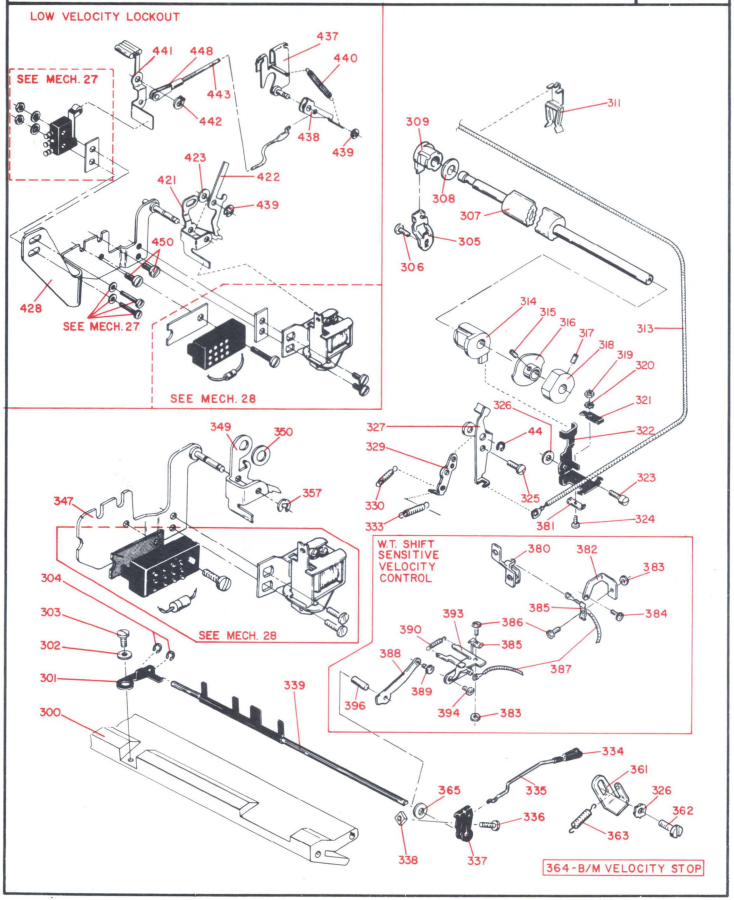
MECH. CODE 21

KEYBOARD SELECTION



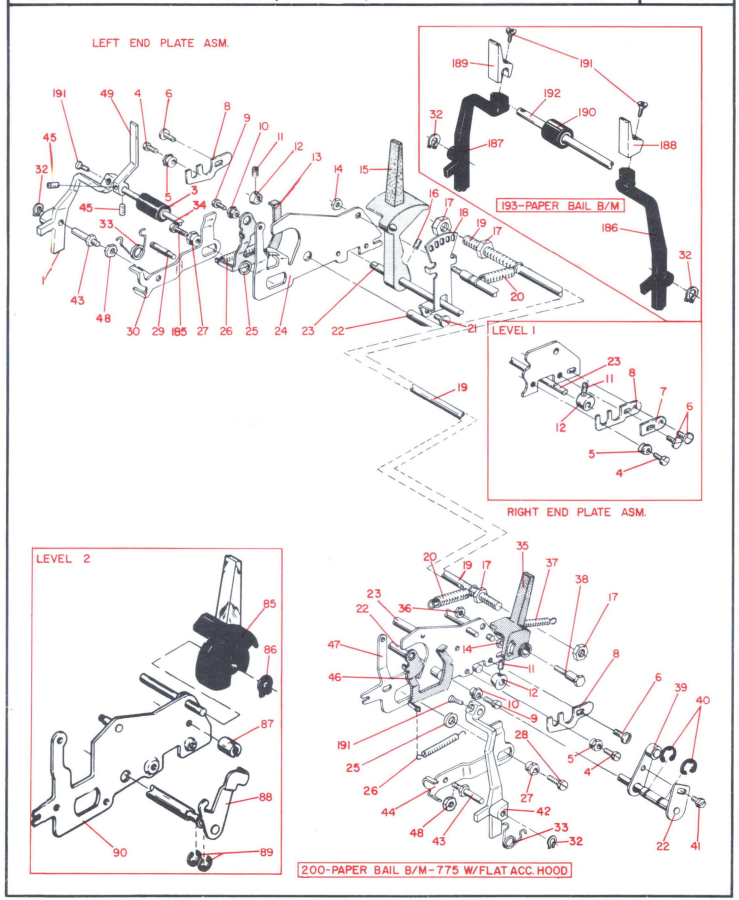
KEYBOARD SELECTION

MECH. CODE 21



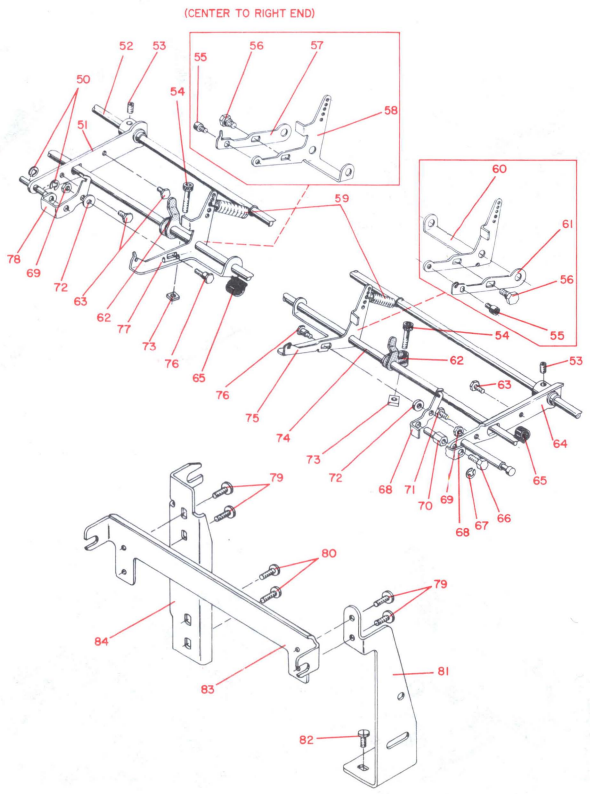
PAPER FEED (TIE ROD)

MECH. CODE 22



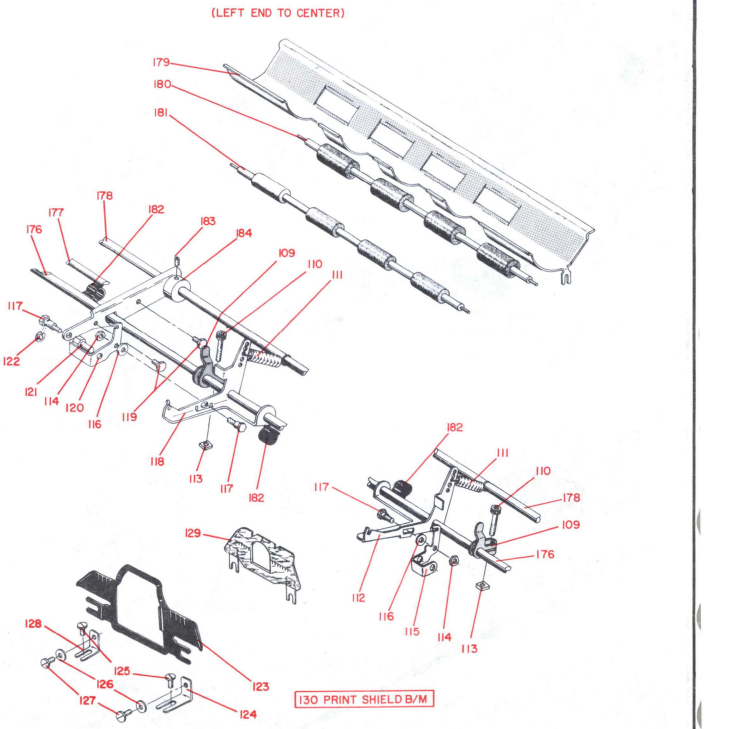
MECH. CODE 22

PAPER FEED
(TIE ROD)



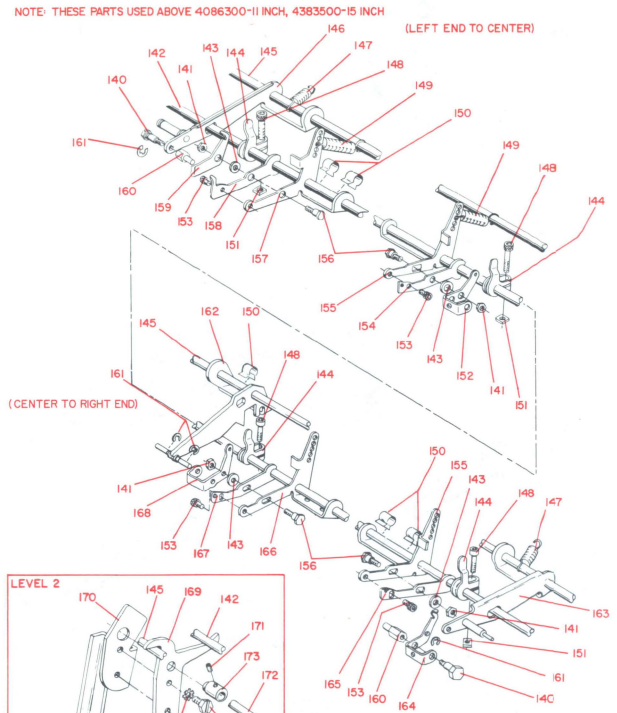
MECH. CODE 22

PAPER FEED
(TIE ROD)



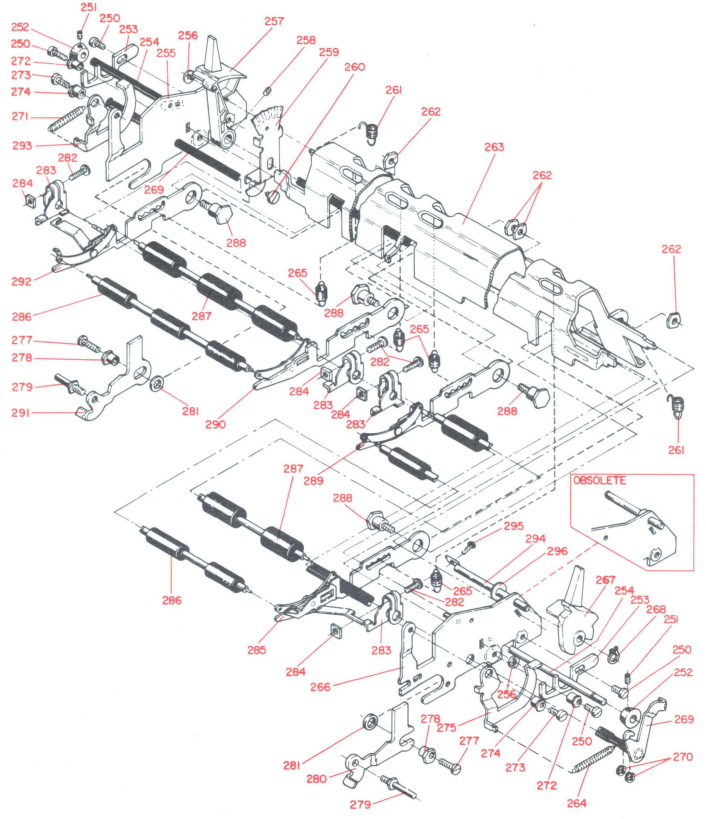
PAPER FEED
(TIE ROD)

MECH. CODE 22



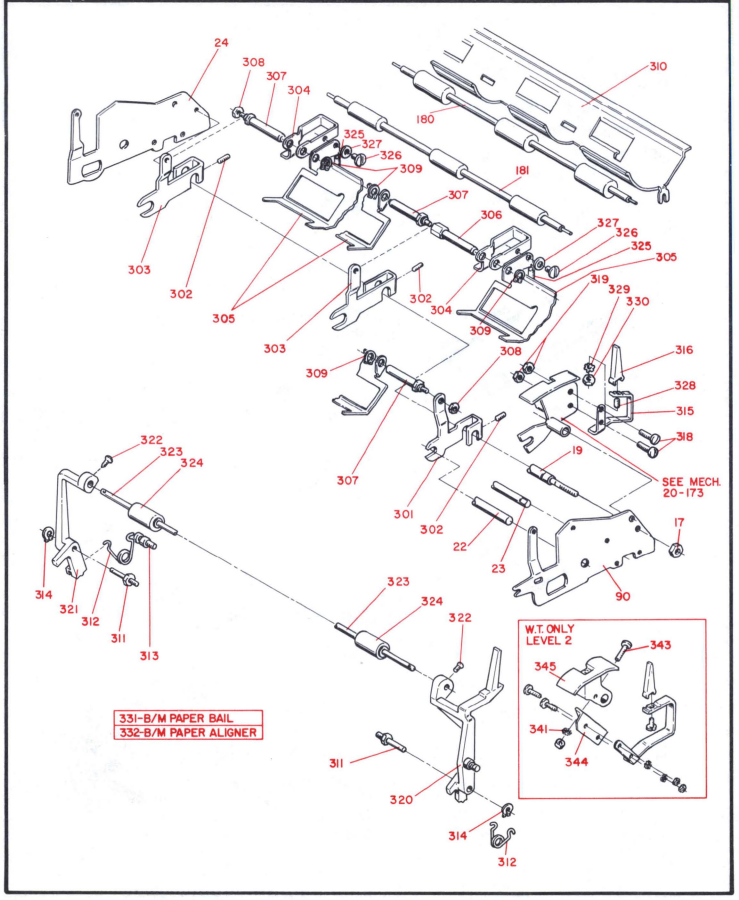
PAPER FEED
(A FRAME)

MECH. CODE 22



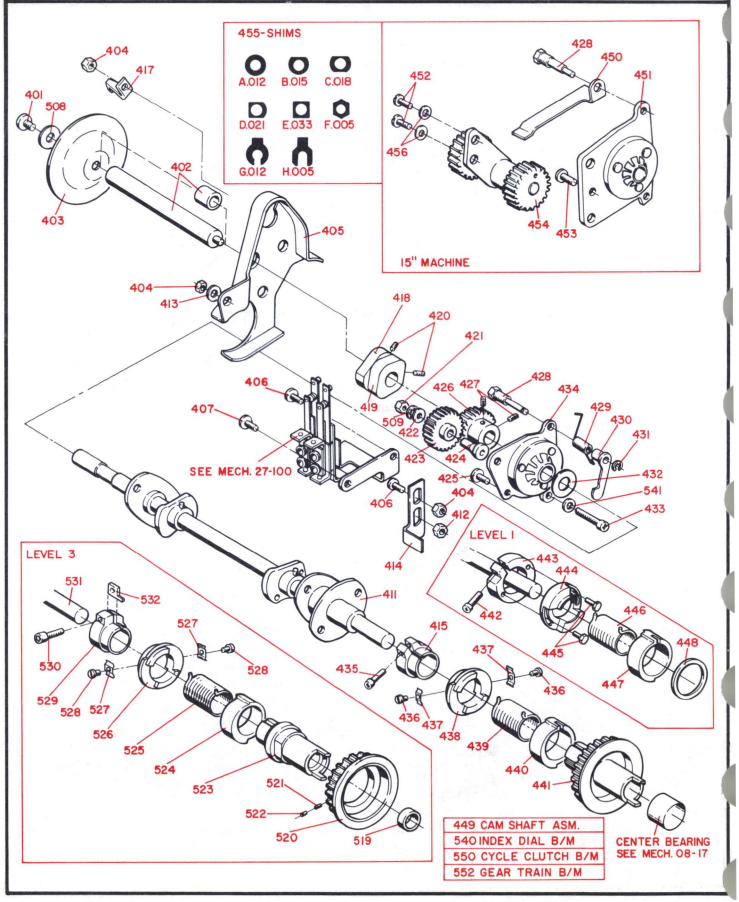
MECH. CODE 22

PAPER FEED
(ACCOUSTIC HOOD, PAPER STACKER)



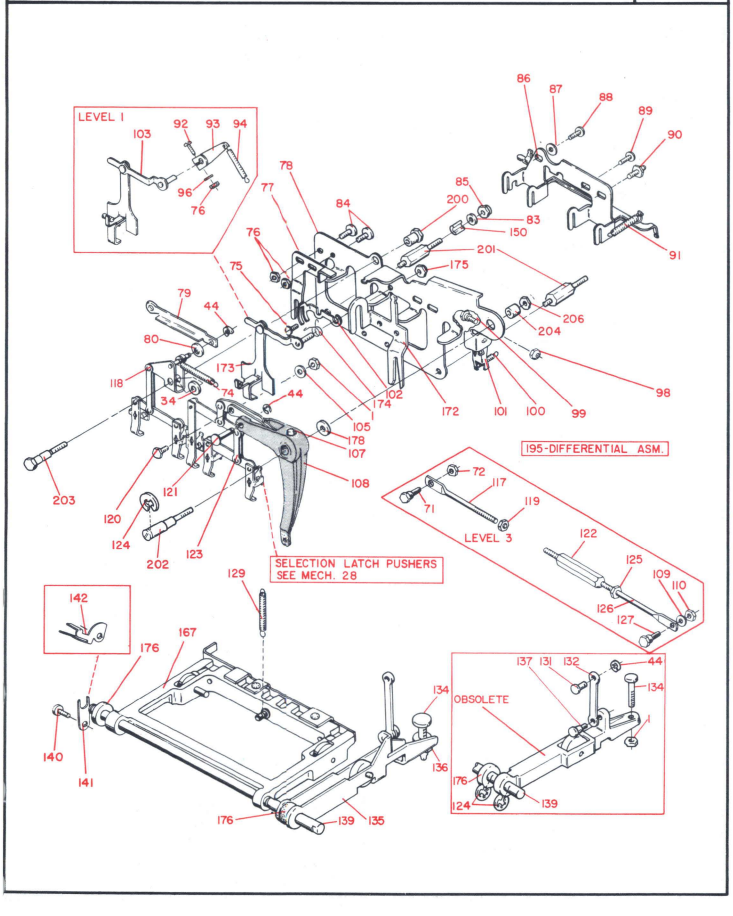
MECH. CODE 23

CYCLE SHAFT



CHARACTER SELECTION

MECH. CODE 23



CHARACTER SELECTION

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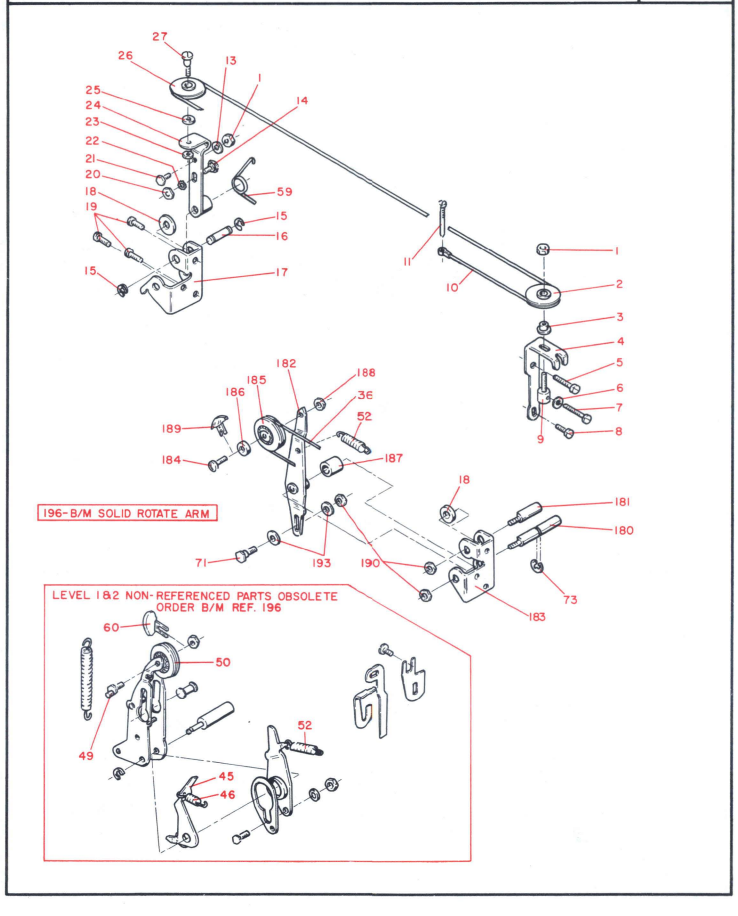
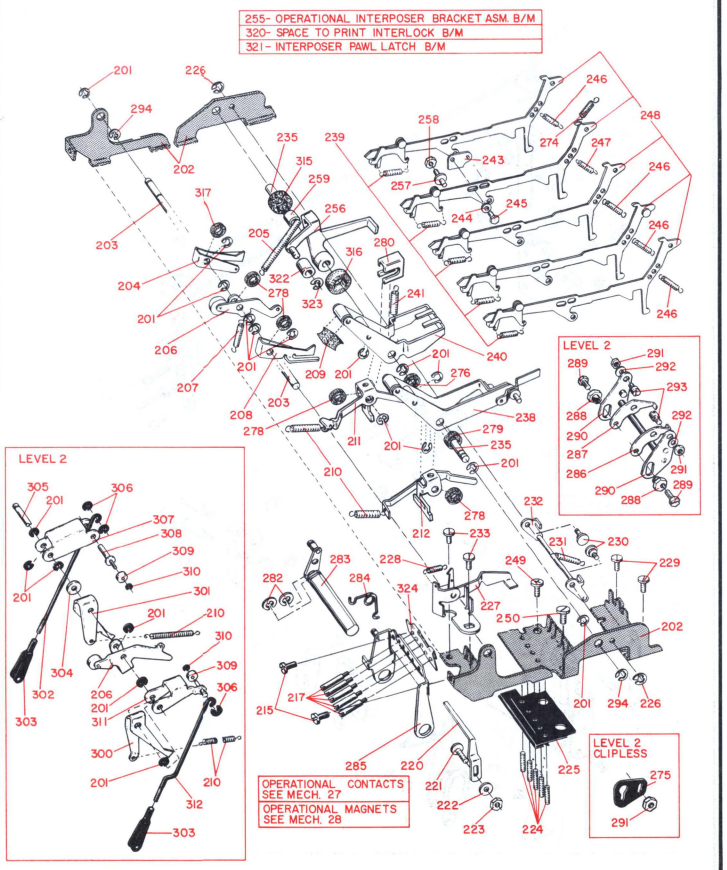


MECH. CODE 25

OPERATIONAL BRACKET

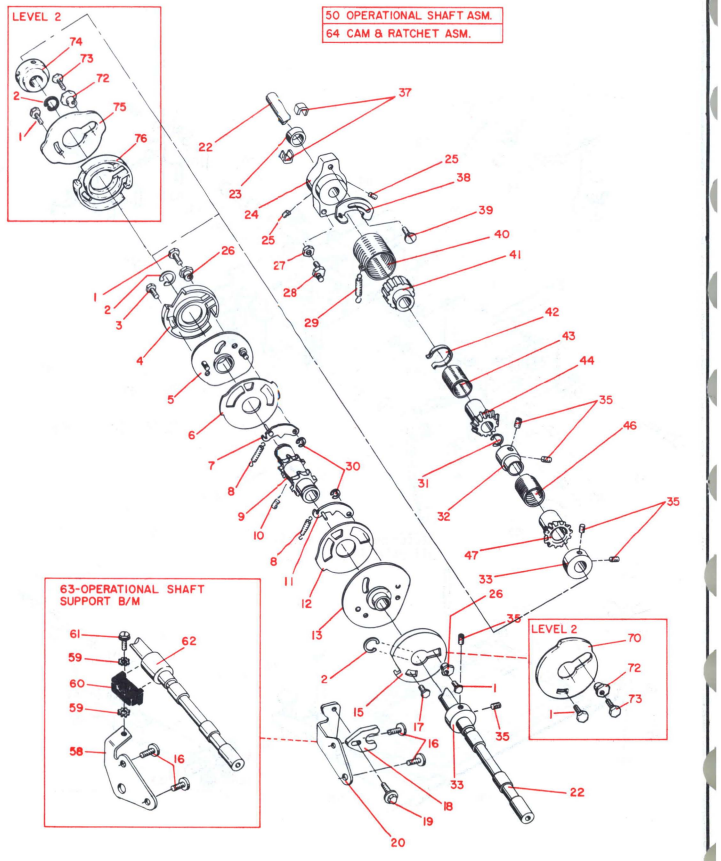
255- OPERATIONAL INTERPOSER BRACKET ASM. B/M
320- SPACE TO PRINT INTERLOCK B/M
321- INTERPOSER PAWL LATCH B/M



MECH. CODE 25

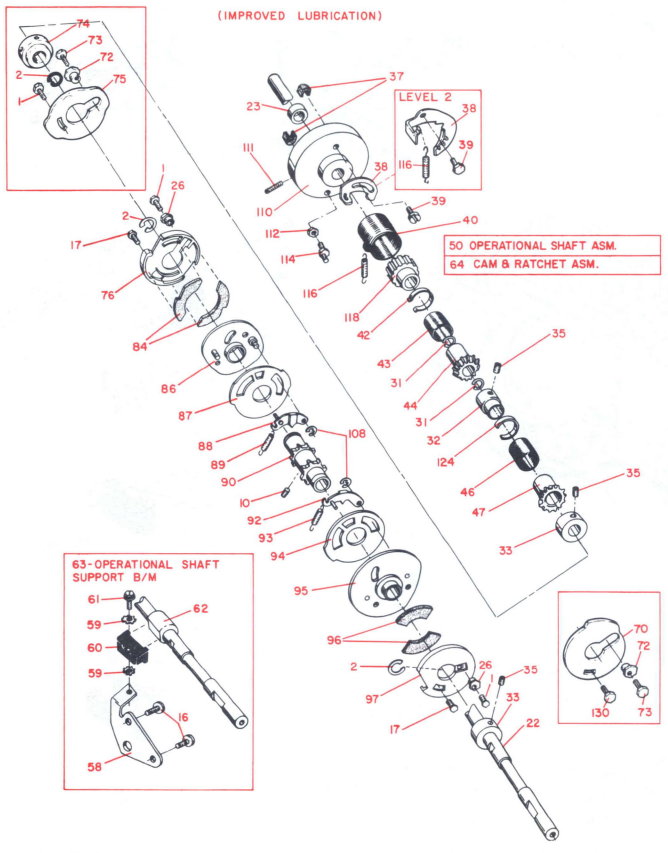
OPERATIONAL SHAFT

50 OPERATIONAL SHAFT ASM.
64 CAM & RATCHET ASM.



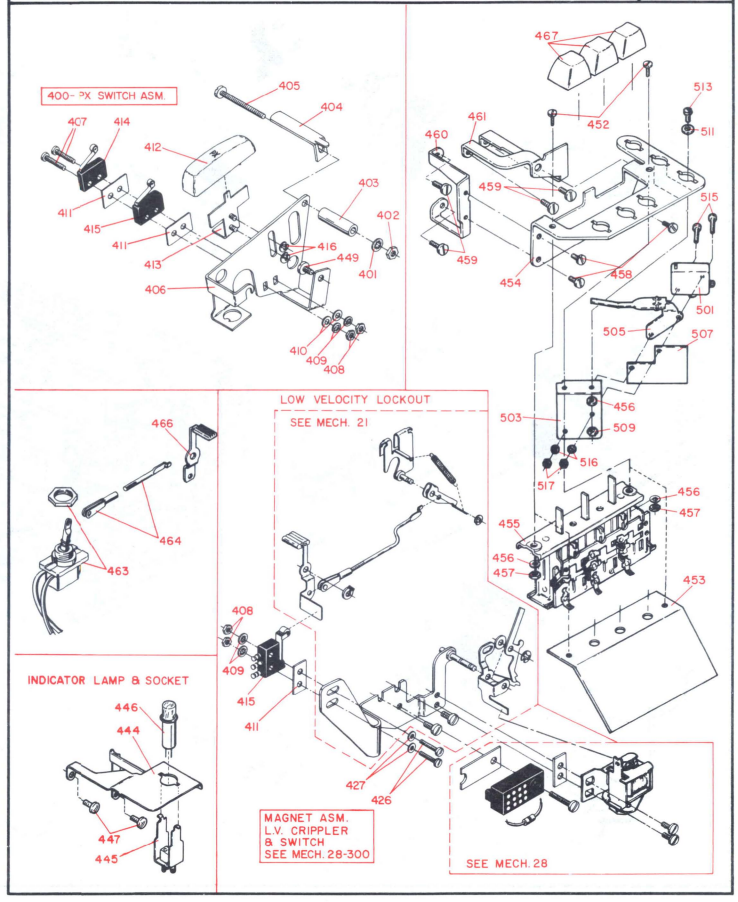
OPERATIONAL SHAFT

MECH. CODE 25



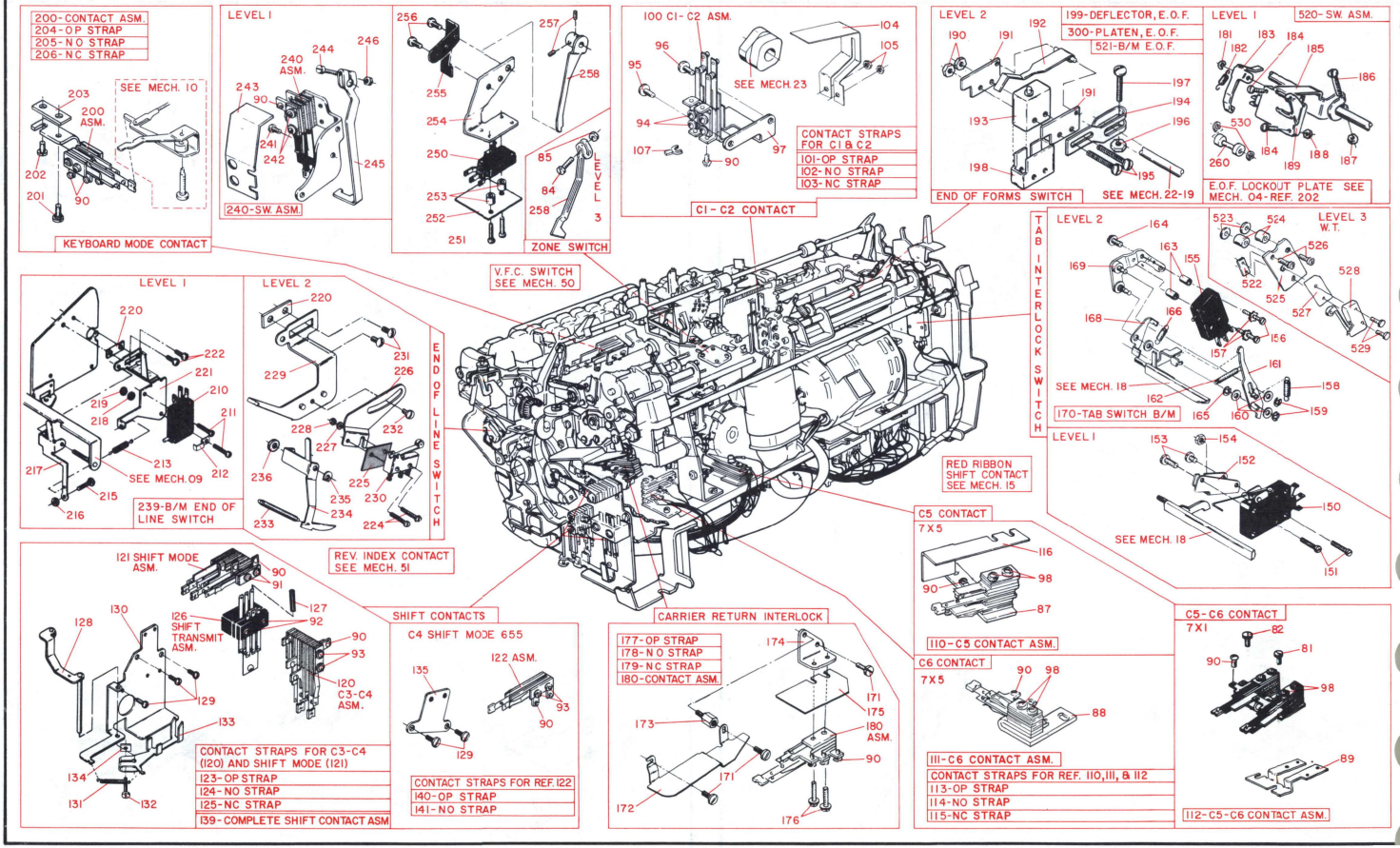
KEYBOARD CONTACTS

MECH. CODE 27



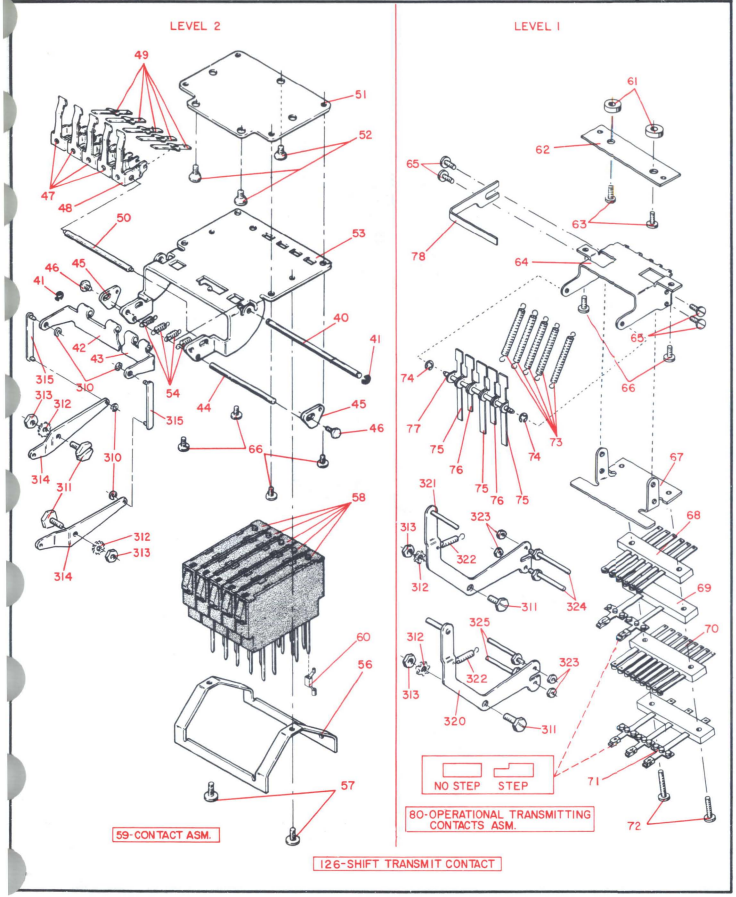
MECH. CODE
27

CONTACTS



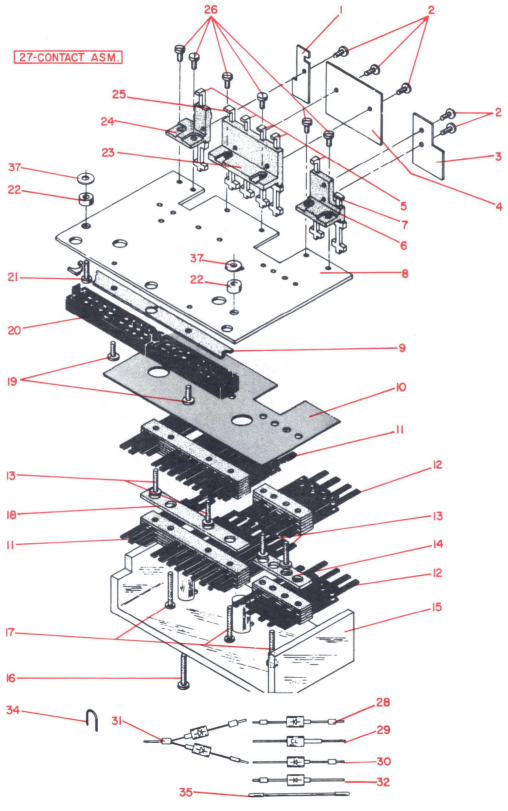
OPERATIONAL TRANSMIT CONTACTS

MECH. CODE 27



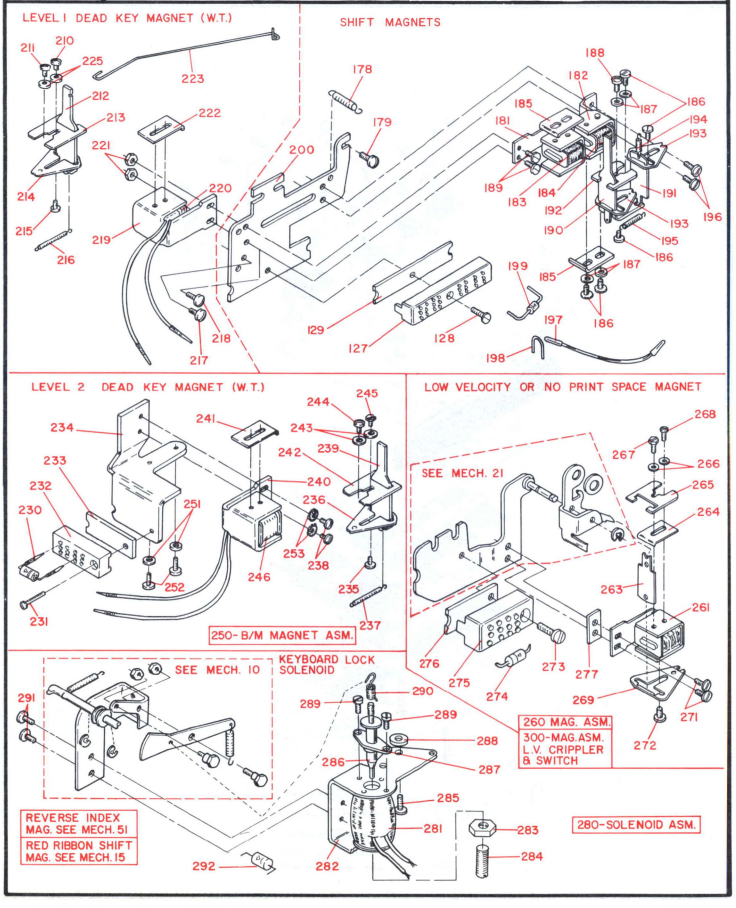
SELECTION TRANSMIT CONTACTS

MECH. CODE 27



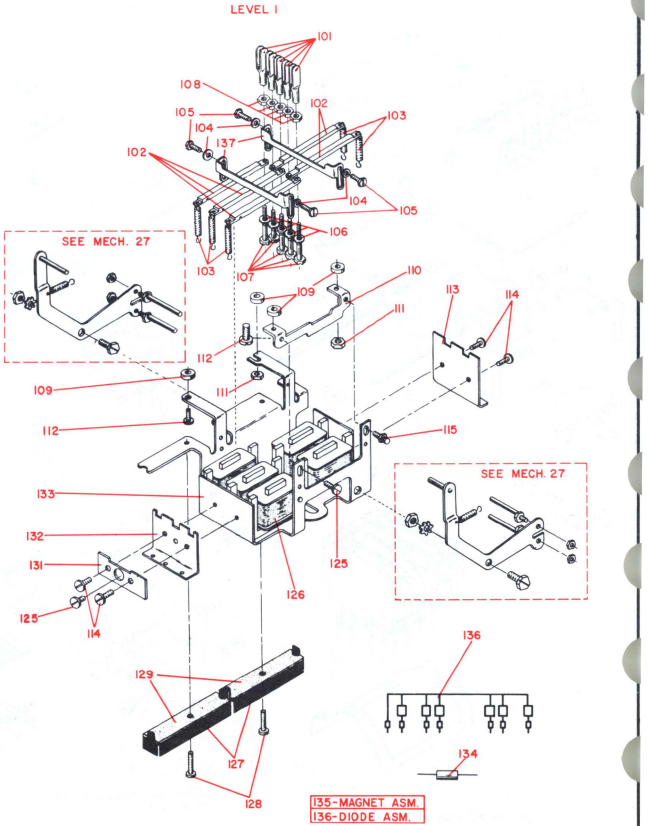
MECH. CODE **28**

MAGNETS
(DK, KBD LK, LV, NP SP & SHIFT)



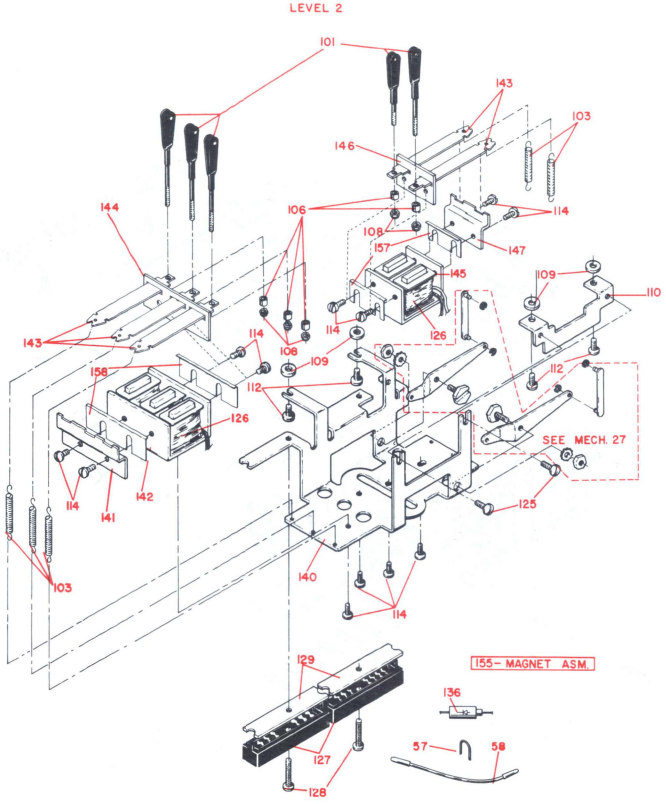
MECH. CODE **28**

OPERATIONAL MAGNETS



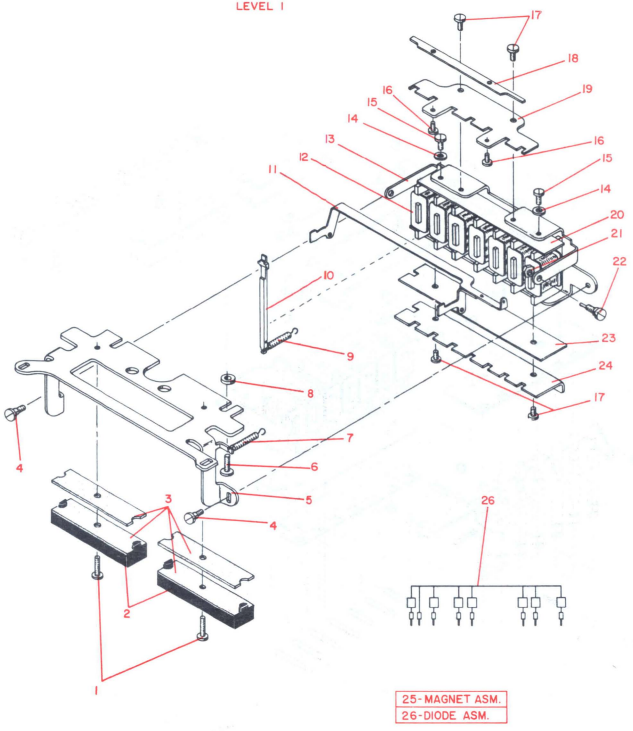
OPERATIONAL MAGNETS

MECH. CODE 28



SELECTION MAGNETS

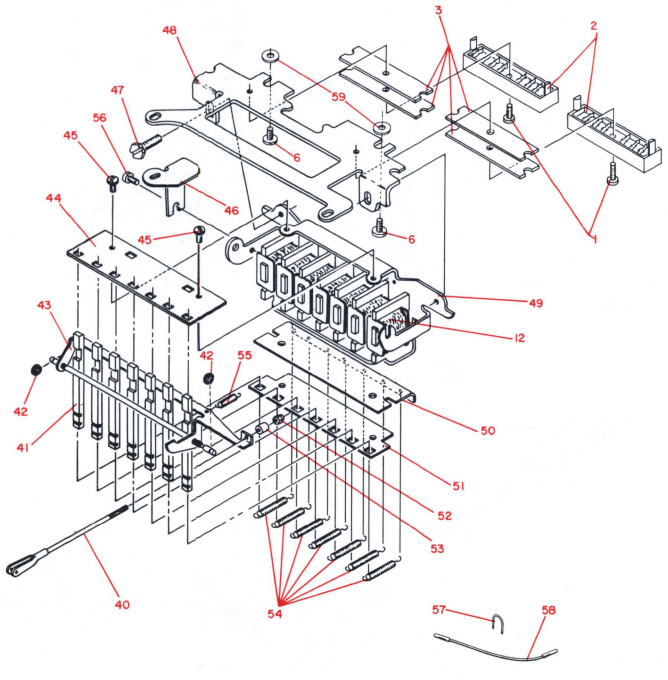
MECH. CODE 28



MECH. CODE 28

SELECTION MAGNETS

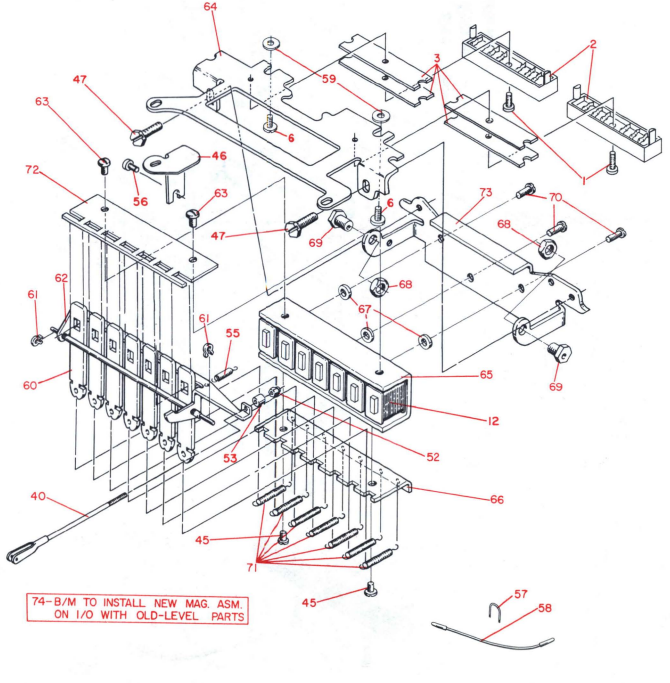
LEVEL 2



MECH. CODE 28

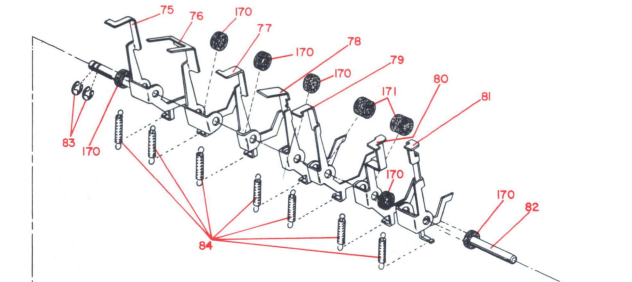
SELECTION MAGNETS

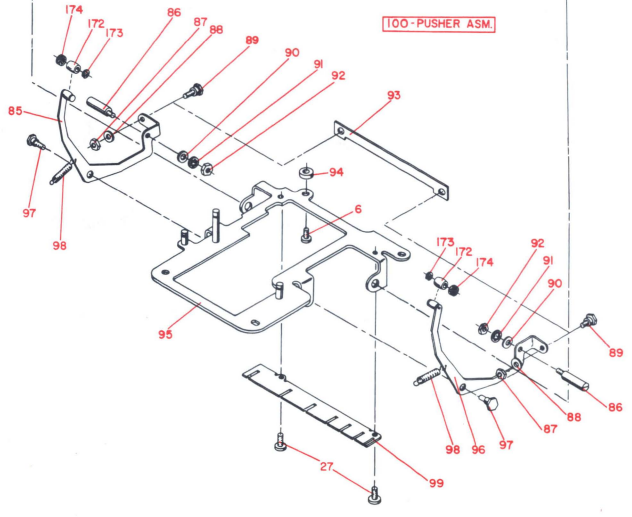
LEVEL 3



SELECTION LATCH PUSHERS

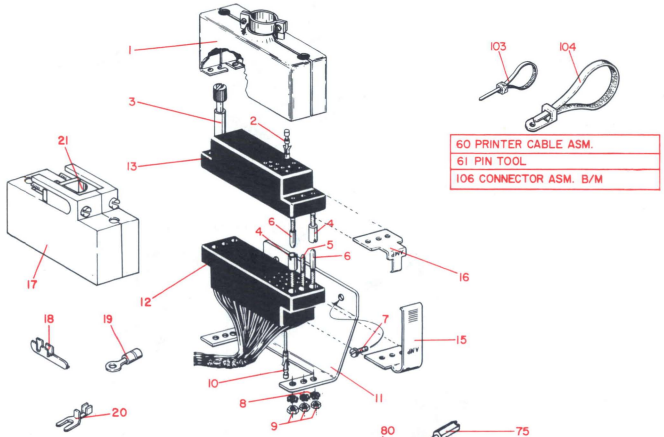
MECH. CODE 28

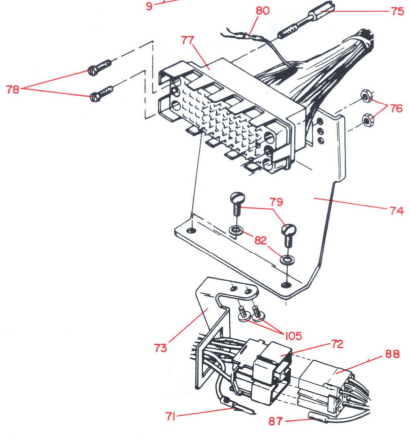




CABLES & CONNECTORS

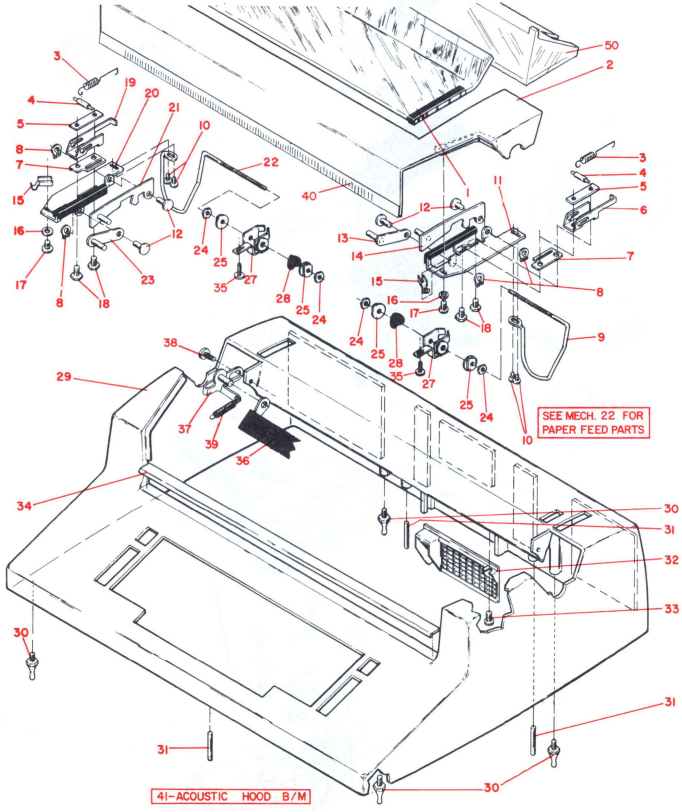
MECH. CODE 29





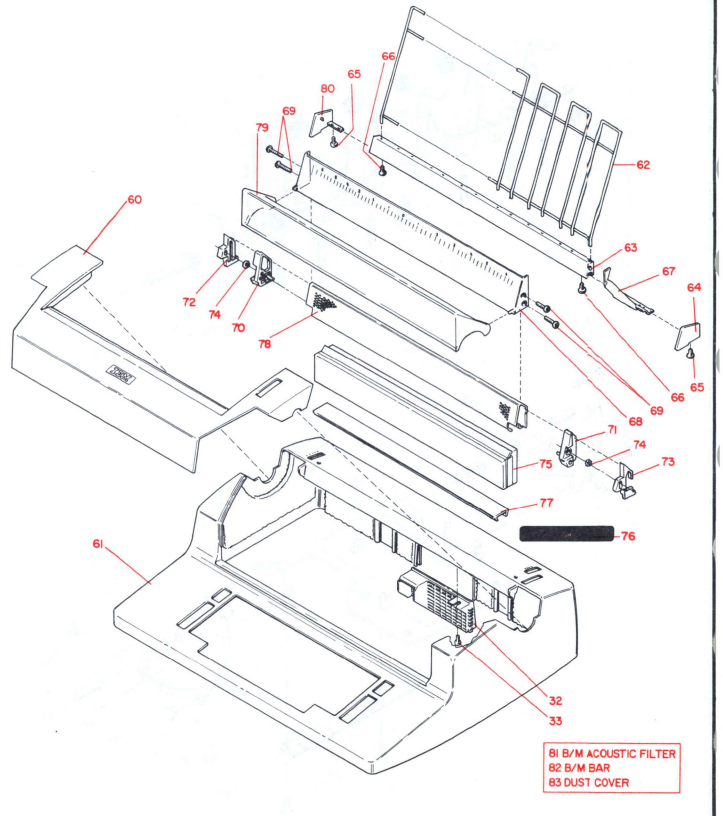
MECH. CODE 30

ACOUSTIC HOOD



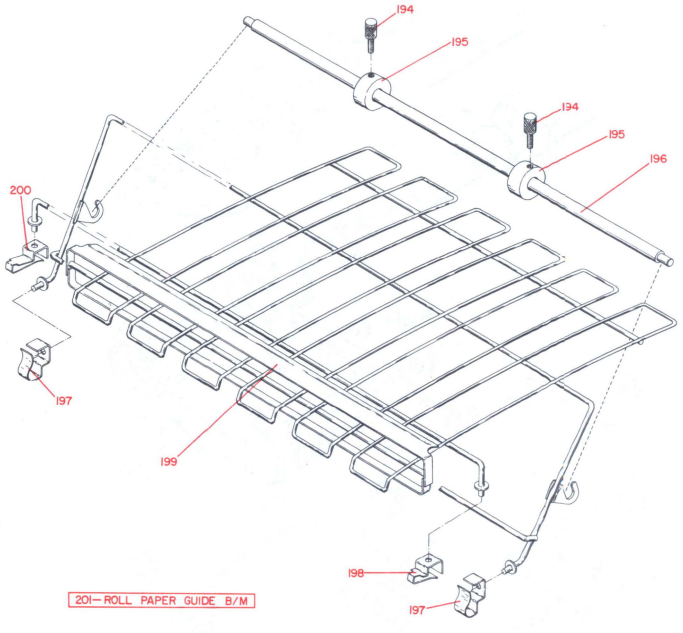
MECH. CODE 30

ACOUSTIC HOOD



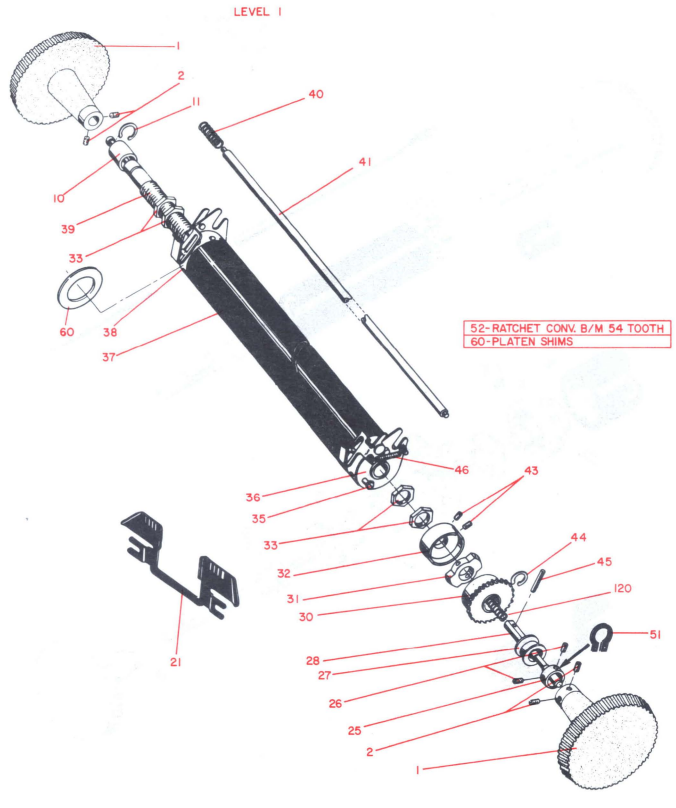
ROLL PAPER HOLDER

MECH. CODE 40



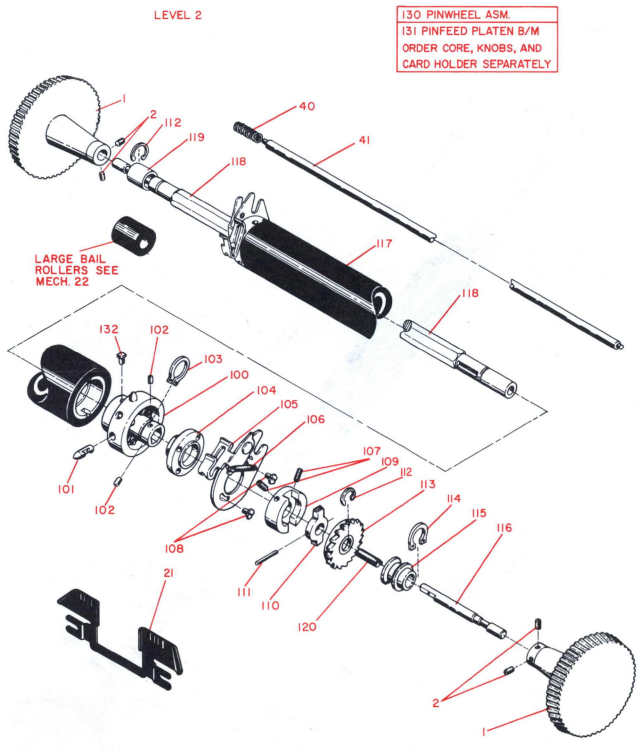
PIN FEED PLATEN

MECH. CODE 49



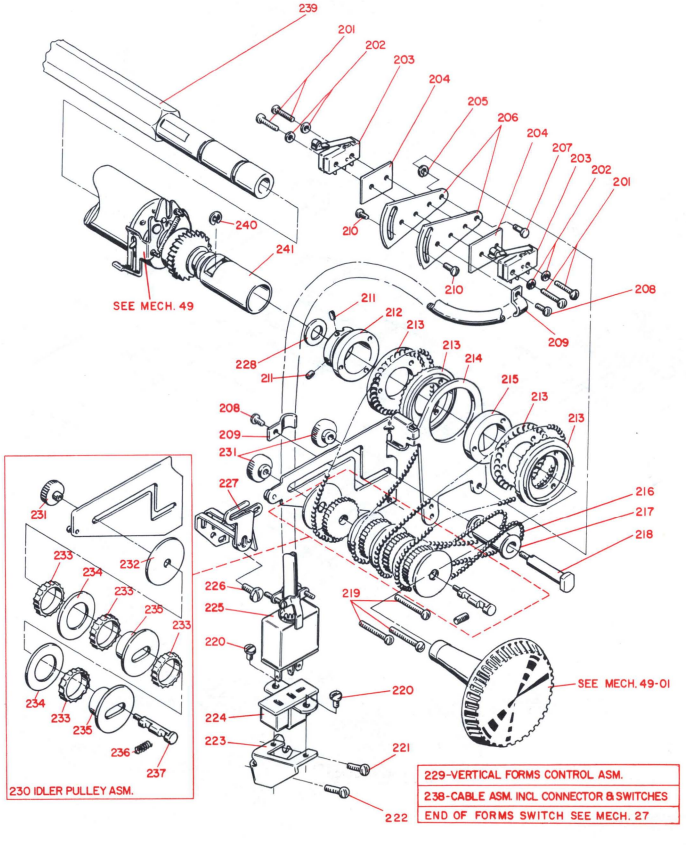
MECH. CODE 49

PIN FEED PLATEN



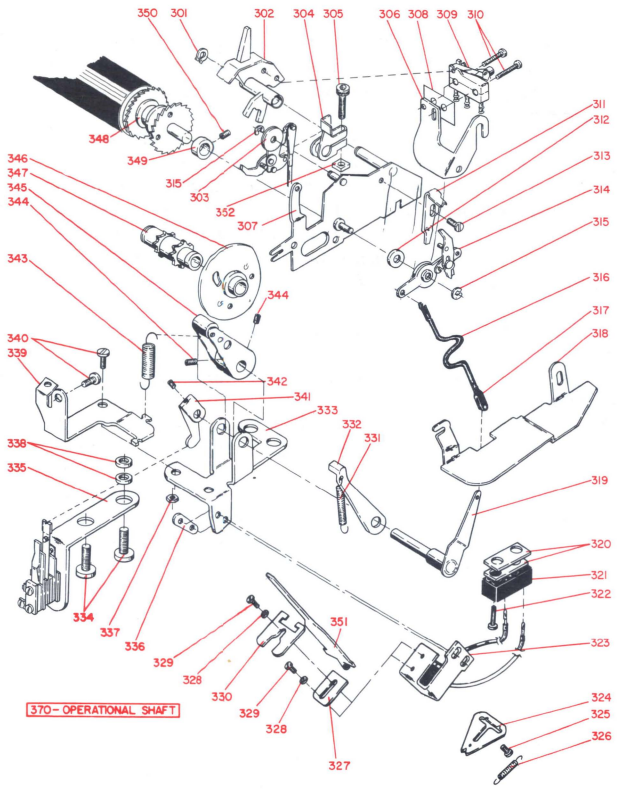
MECH. CODE 50

VERTICAL FORMS CONTROL



REVERSE INDEX

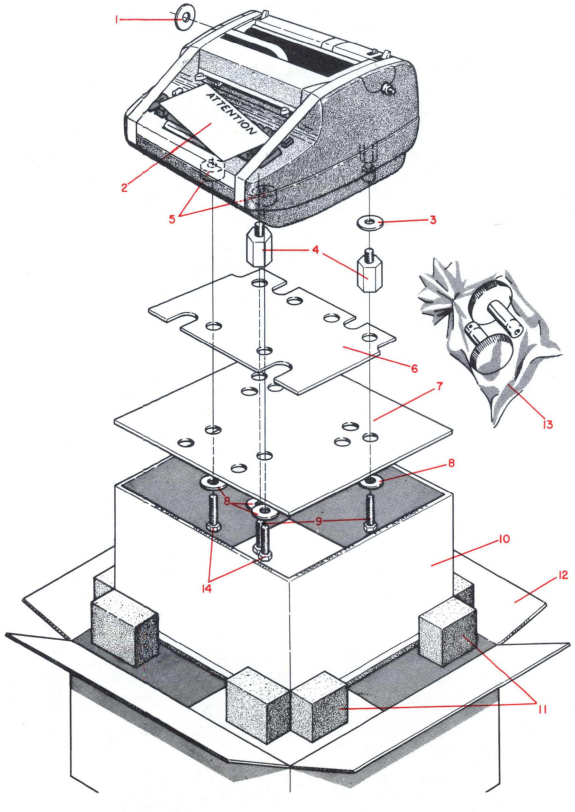
MECH. CODE 51



MECH. CODE

MECH. CODE 65

PACKING PARTS



MECH. CODE 65

PACKING INSTRUCTIONS

A. Remove top cover and tilt machine up. Insert (2) spacer legs in (2) front cutouts of sound deadening material; position over holes in bottom cover. Screw (2) leg extensions with washers into rear legs. Reposition machine and replace top cover.

B. Move carrier mechanism to extreme left; depress tab torque bar and while holding carrier, tape into position as shown.

C. For machines equipped with carbon ribbon attachment, clean underside of carrier. Move carrier to extreme left; take a piece of tape about 8 inches long and tape on the underside of the carrier to the front as close to the print shaft as possible; while depressing tab button, pull carrier to extreme left and fasten tape to the top front cover.

D. On Std platen machines, remove platen and place platen retainer over left hand platen, flush against end of platen. Replace and secure platen in normal position. Close top cover and tape to bottom cover.

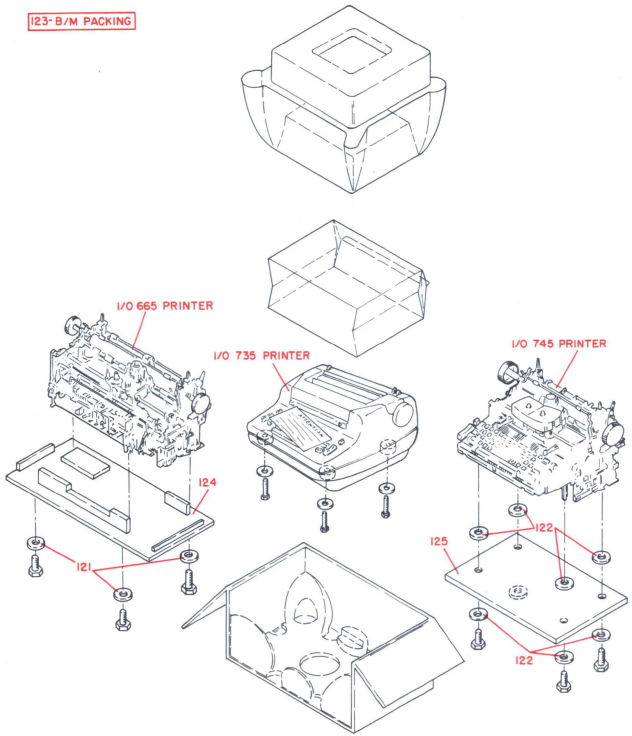
E. On machines with sound deadening feature, tape acrylic shield in the center of machine to rear of top cover. Tape both sides to right and left of top cover.

F. Tilt machine to rear so bottom of machine is accessible. Fasten pallets small and large to machine using hex head bolts and washers.

G. Tape bottom of carton; place two foam pads in bottom. Place two platen knobs in polybag and place in bottom. Place palletized machine in carton.

W.T. PACKING PARTS

MECH. CODE 65



W.T. PACKING INSTRUCTIONS

MECH. CODE 65

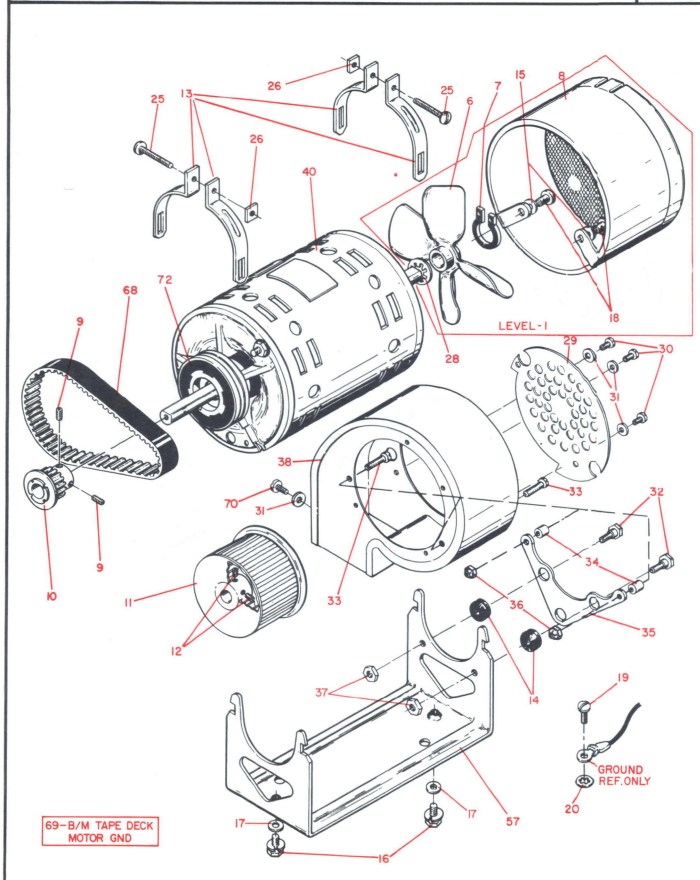
A. Remove center cover and place machine in tilt-up position.
   Select 4 spaces for correct height (see spacer table).
   When machine is tilted down, machine must just rest on spacers.
B. Move machine down and place shipping spacers and shipping screws.
C. Place machine in polybag.
D. Place machine in carton, positioned so it rests on foam ring centered in carton.
E. Place accessory group at left end of machine; fold top of polybag and secure bag with tape.
F. Insert top cushion in carton.
G. Close carton and tape.

SPACER TABLE

Height in mm	Part No.	Color
14,2	8174073	Blue
15,5	8174074	Yellow
18,2	8174075	White
18,7	8174076	Grey

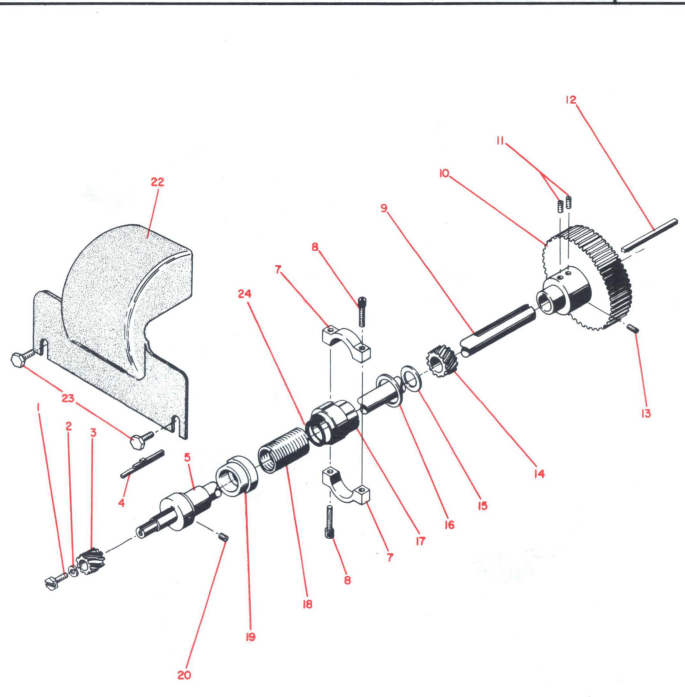
MOTOR & FAN

MECH. CODE 66



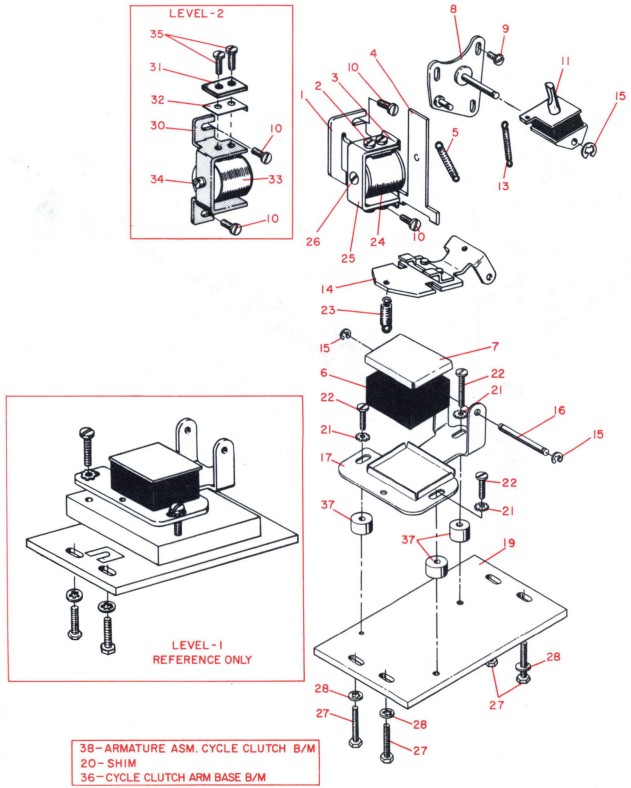
DRIVE SHAFT & CYCLE CLUTCH

MECH. CODE 67



MECH. CODE
68

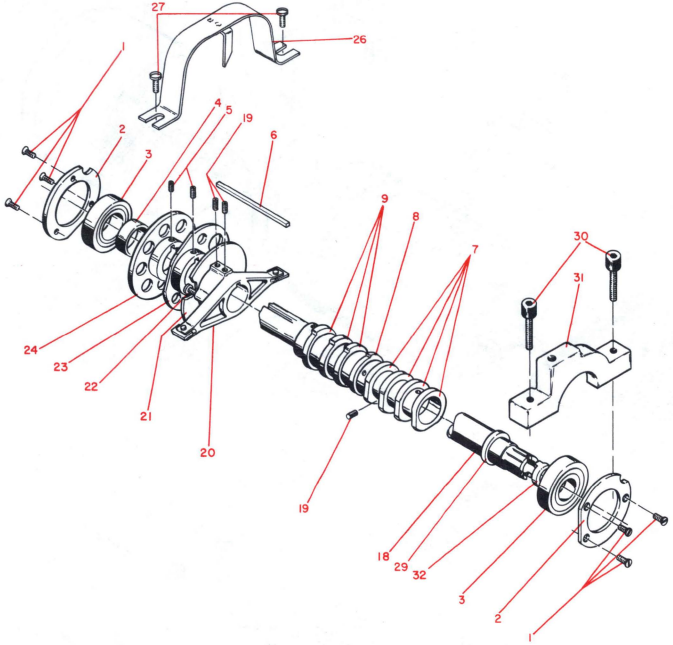
CYCLE CLUTCH MAGNET & DETENT



38-ARMATURE ASM. CYCLE CLUTCH B/M
20-SHIM
36-CYCLE CLUTCH ARM BASE B/M

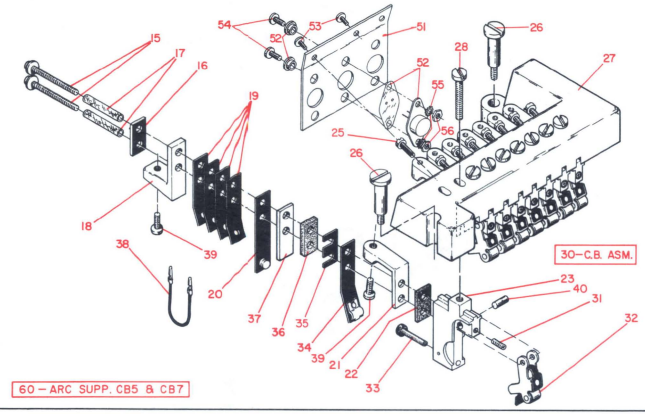
MECH. CODE
69

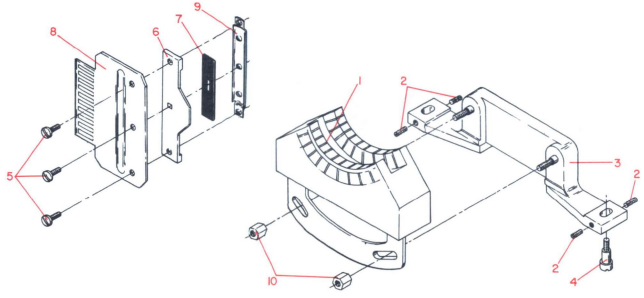
DRIVE SLEEVE



EMITTER & C.B.'s

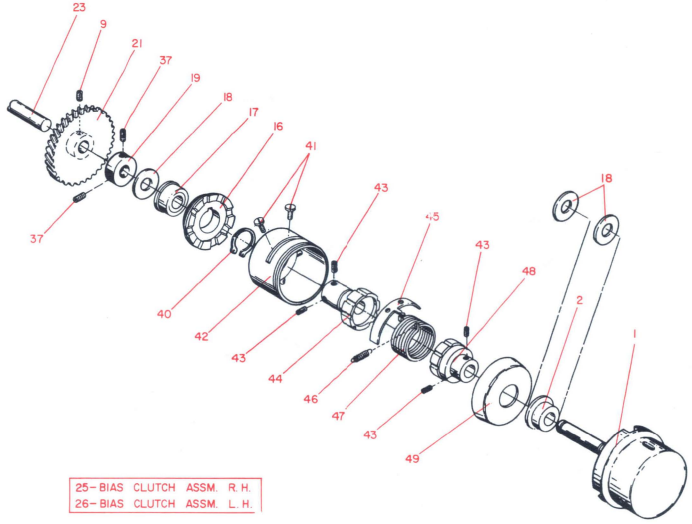
MECH. CODE 70





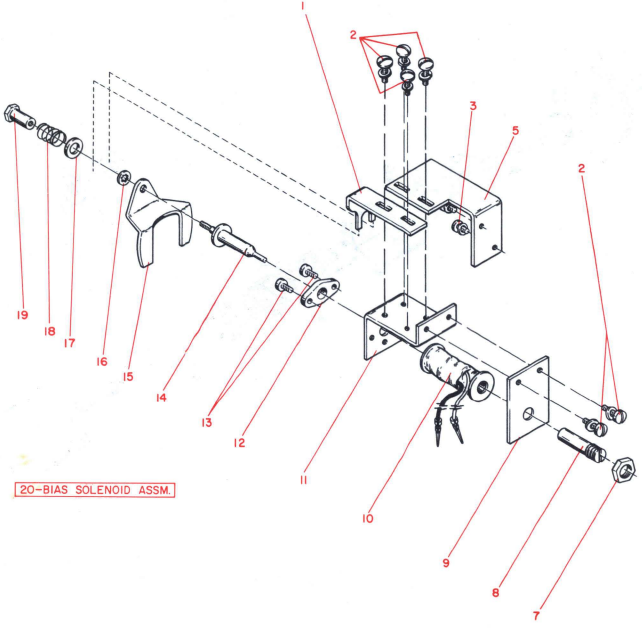
REWIND SHAFT

MECH. CODE 71



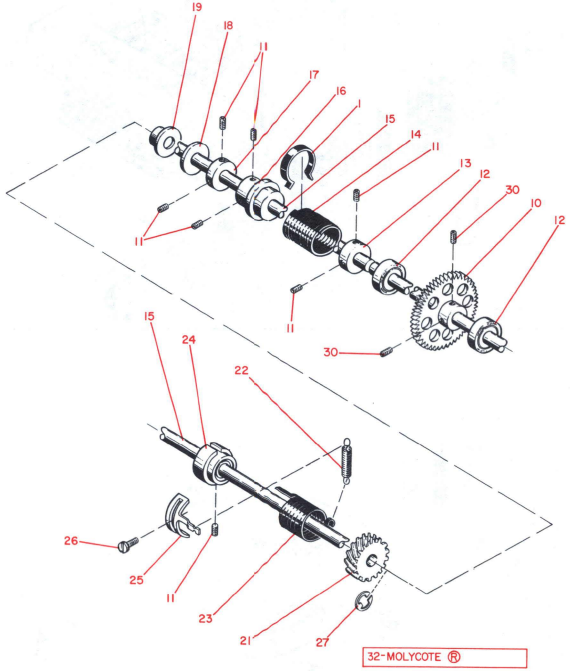
MECH. CODE 72

BIAS SOLENOID



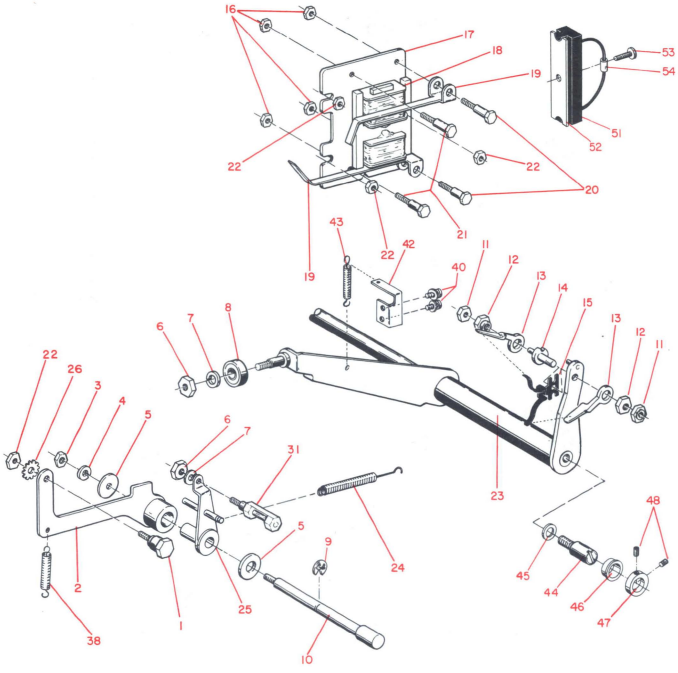
MECH. CODE 73

TORQUE LIMITER SHAFT



STEPPING MECHANISM

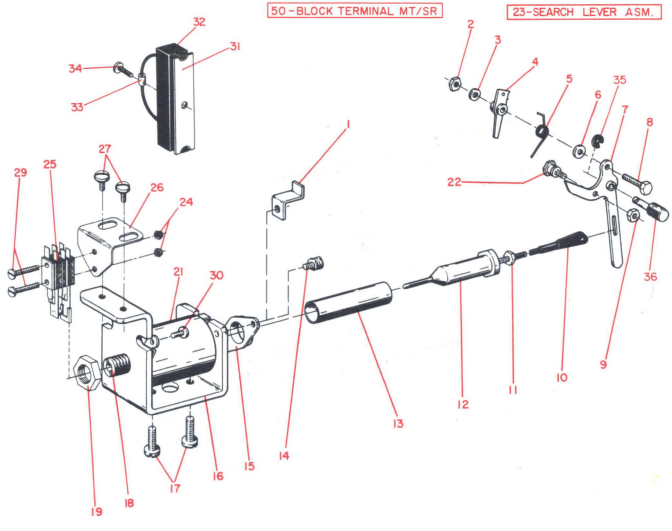
MECH. CODE 74



55–DETENT LEVER STUD REPLACEMENT B/M
60–MAGNET ASM.,STEPPING

DETENT SOLENOID & LEVERS

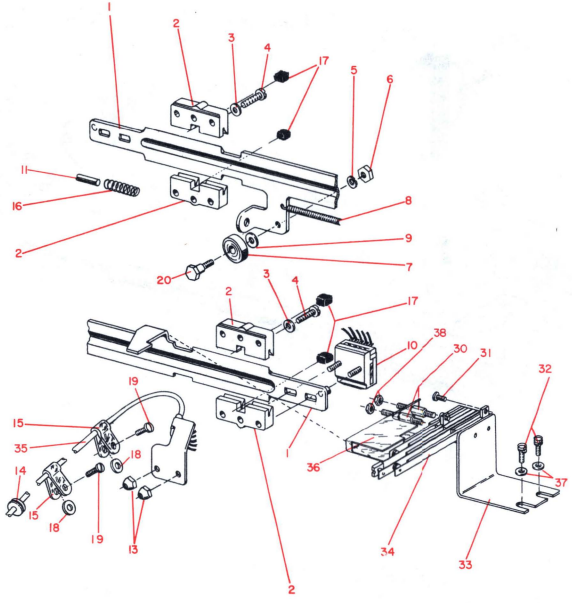
MECH. CODE 76



37–DETENT SOLENOID ASM.

MECH. CODE 77

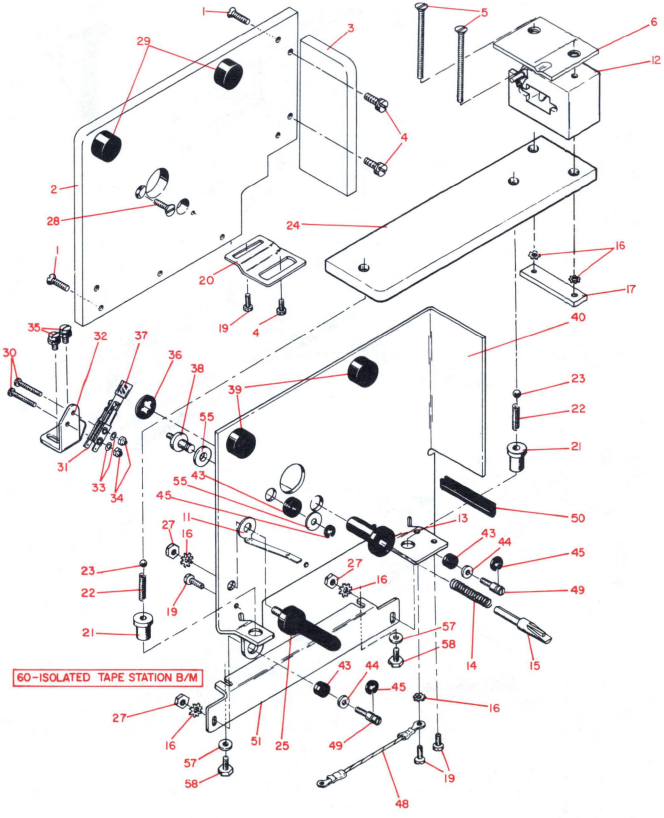
HEAD & SLIDE



40-TAPE DEVELOPER

MECH. CODE 78

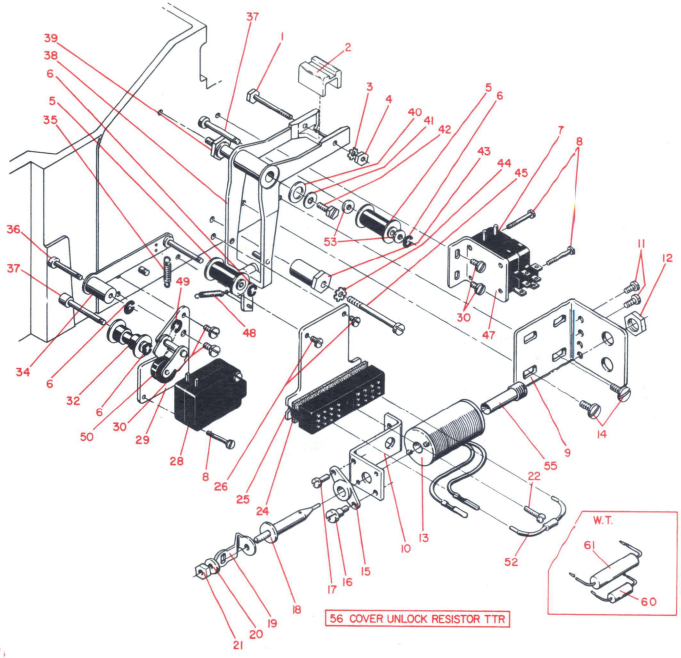
STATION PLATFORM



60-ISOLATED TAPE STATION B/M

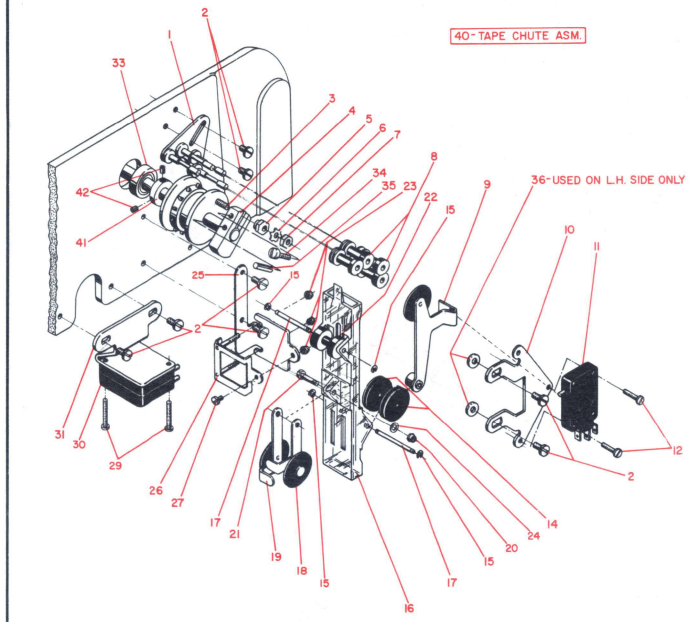
TAPE PATH SUPPORT & GUIDE

MECH. CODE 79



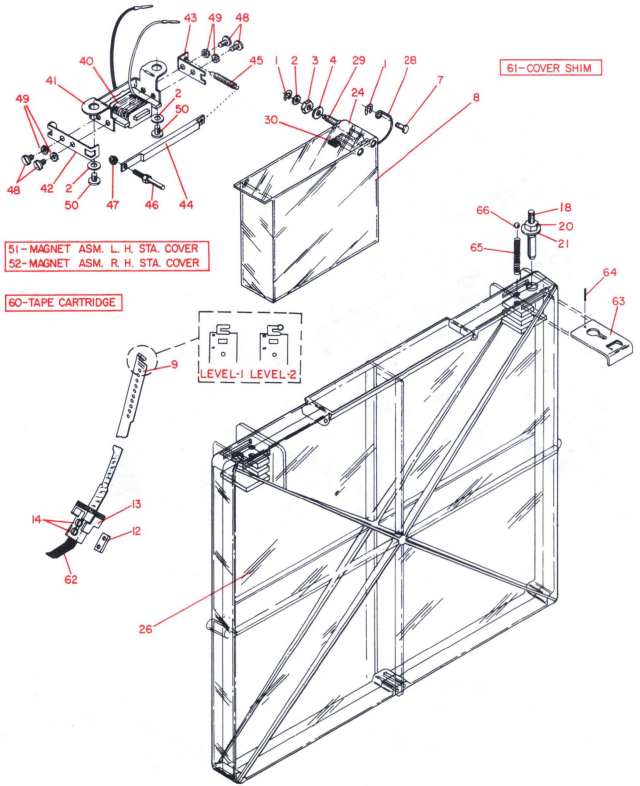
TAPE PATH DRIVE

MECH. CODE 80



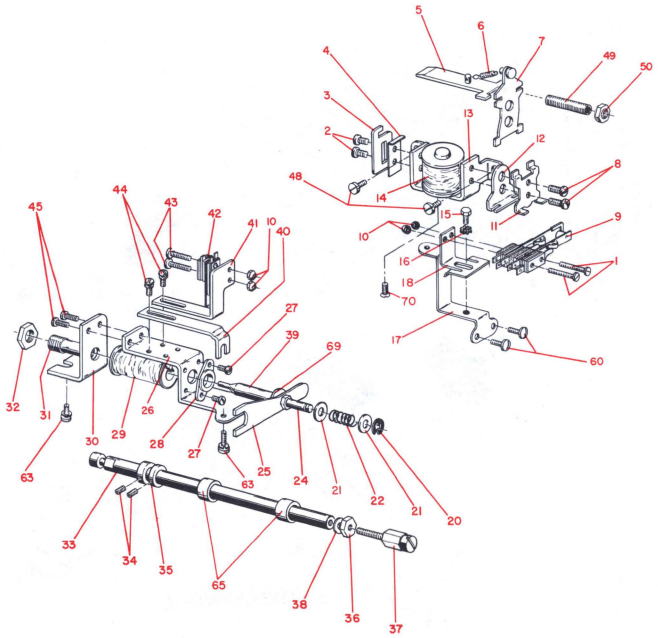
MECH. CODE
81

TAPE BIN



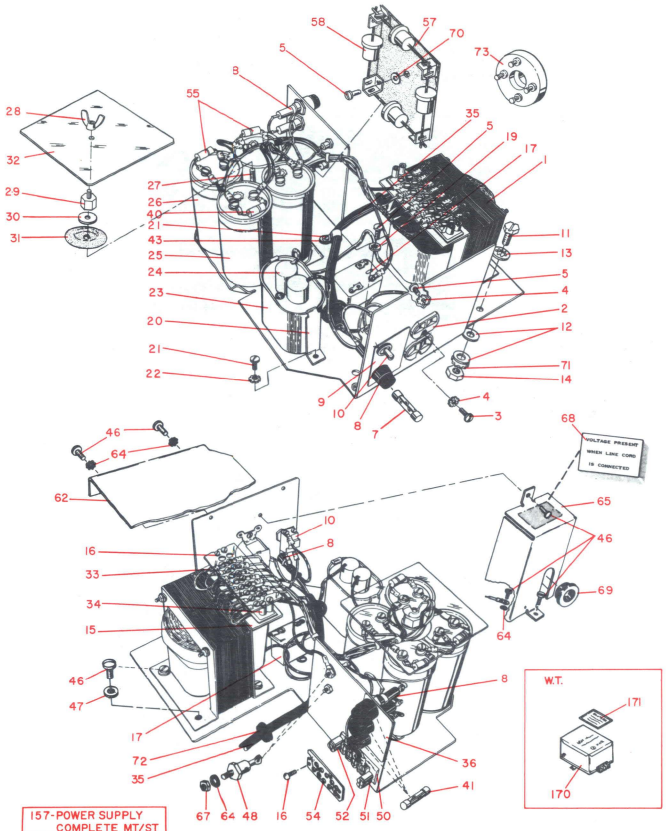
MECH. CODE
82

SEARCH SOLENOID & MAGNET



POWER SUPPLY

MECH. CODE 83

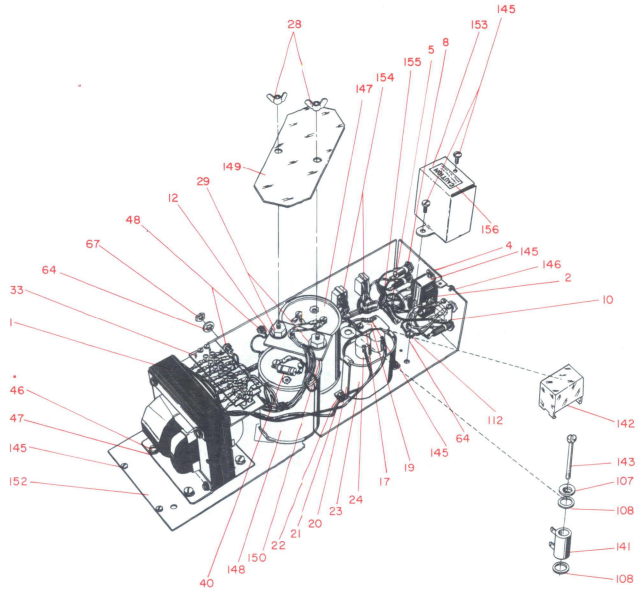


157-POWER SUPPLY COMPLETE MT/ST

180-B/M PCB FREE CAPACITOR

POWER SUPPLY

MECH. CODE 83

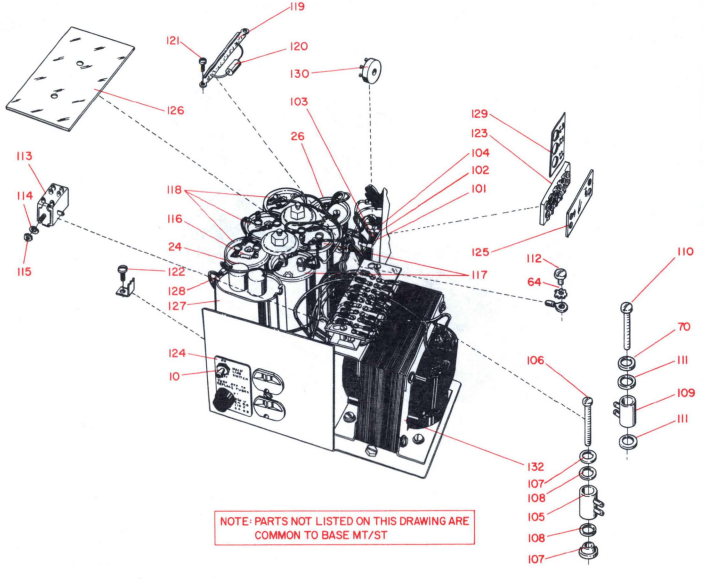


NOTE- PARTS NOT LISTED ON THIS DRAWING ARE COMMON TO BASE MT/ST

158 POWER SUPPLY COMPLETE MT/SR

MECH. CODE **83**

POWER SUPPLY

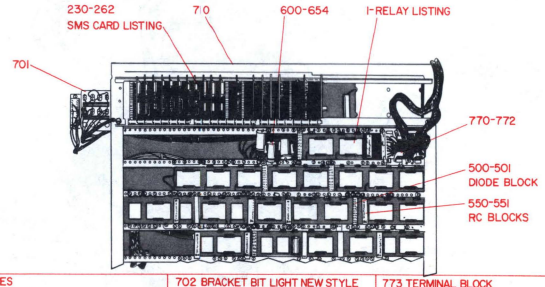


NOTE: PARTS NOT LISTED ON THIS DRAWING ARE COMMON TO BASE MT/ST

158 POWER SUPPLY COMPLETE MT/SR

MECH. CODE **84**

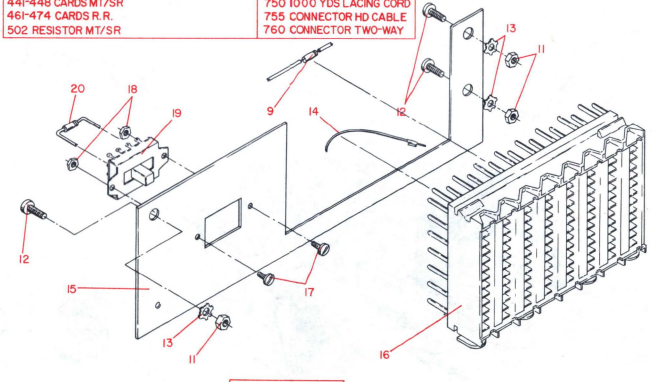
RELAYS & ELECTRONICS



2 CONTACT WIRES
3 12 POS DUMMY PLUG
4 TEST LIGHT BULB
100 B/M IMPROVED CODE CONVERSION (C.E.M 68)
101 B/M HOT KEYBOARD WIRING CHANGE (C.E.M 74)
102 B/M ARC SUPPRESSION (C.E.M 153)
441-448 CARDS MT/SR
461-474 CARDS R.R.
502 RESISTOR MT/SR

702 BRACKET BIT LIGHT NEW STYLE
725 BLUE JUMPER
735 BRASS JUMPERS
739 SPAGHETTI
740 TAPER PINS
745 100' ROLL OF YELLOW
750 1000 YDS LACING CORD
755 CONNECTOR HD CABLE
760 CONNECTOR TWO-WAY

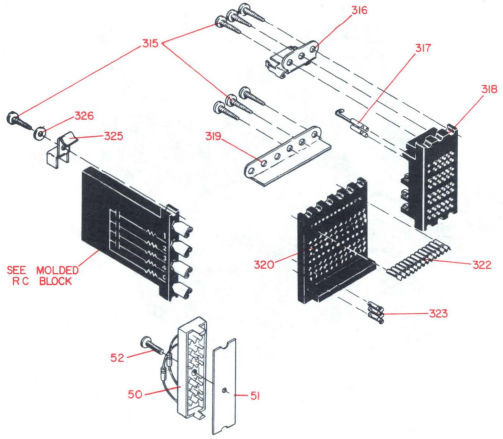
773 TERMINAL BLOCK
800 DIAGRAMS RELAY WIRING
851 MONITOR COVER
852-858 MONITOR



10-SWITCH B/M

RELAYS & ELECTRONICS

MECH. CODE 84

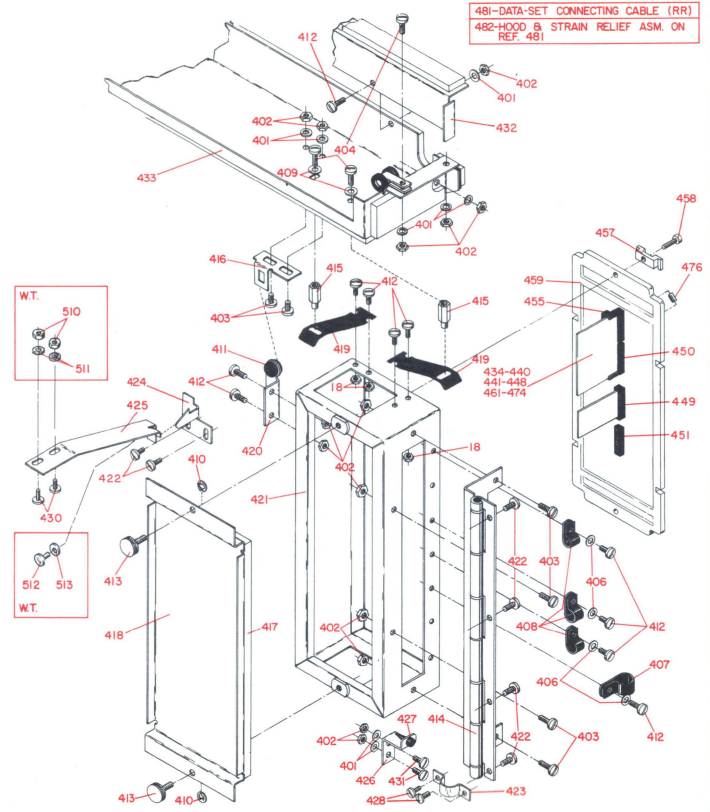


852-858 B/M MAINTENANCE MONITOR

SLD ELECTRONIC GATES

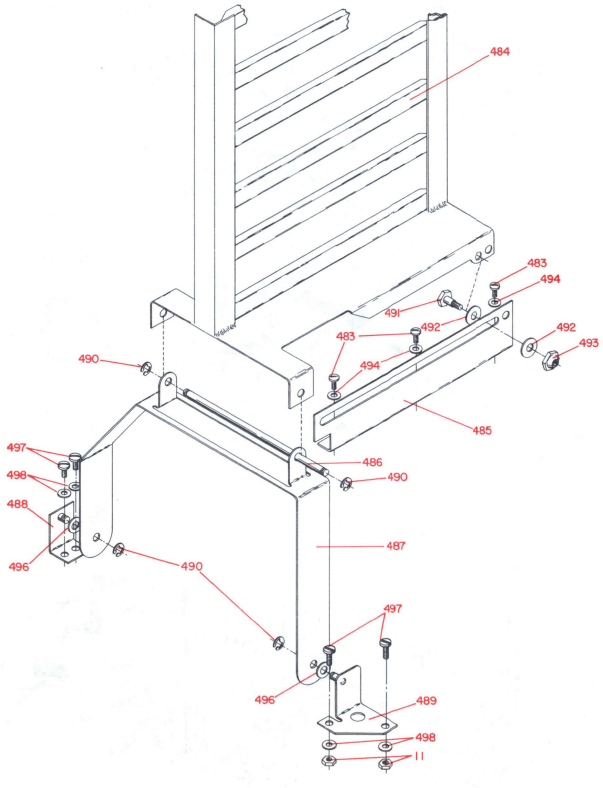
MECH. CODE 84

481-DATA-SET CONNECTING CABLE (RR)
482-HOOD & STRAIN RELIEF ASM. ON REF. 481



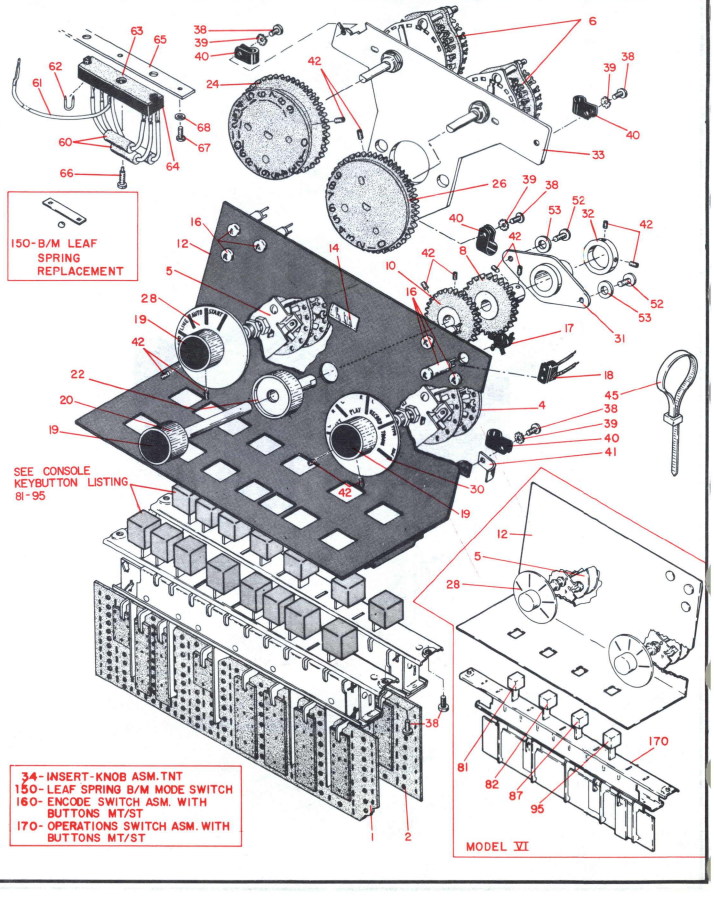
MECH. CODE
84

AUXILIARY RELAY GATE



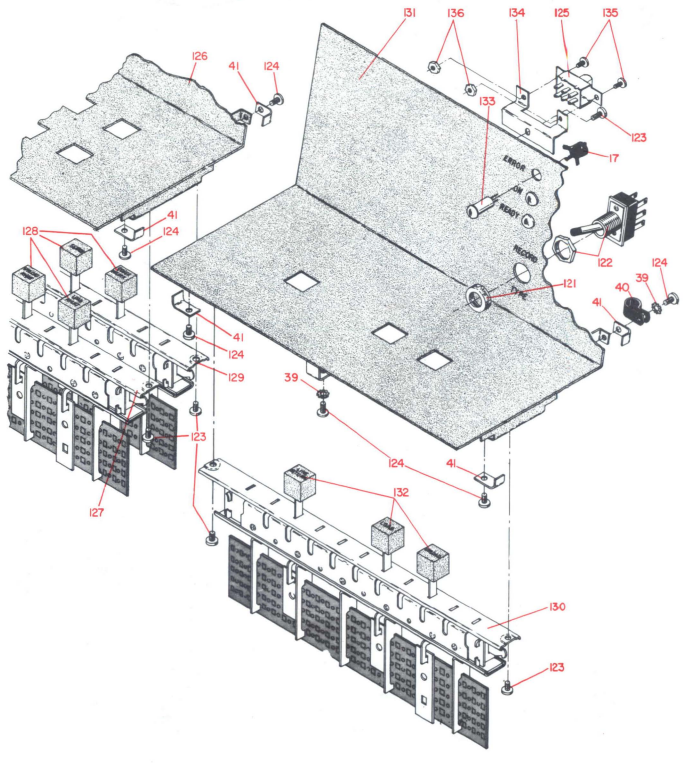
MECH. CODE
86

CONTROL PANEL & SWITCHES



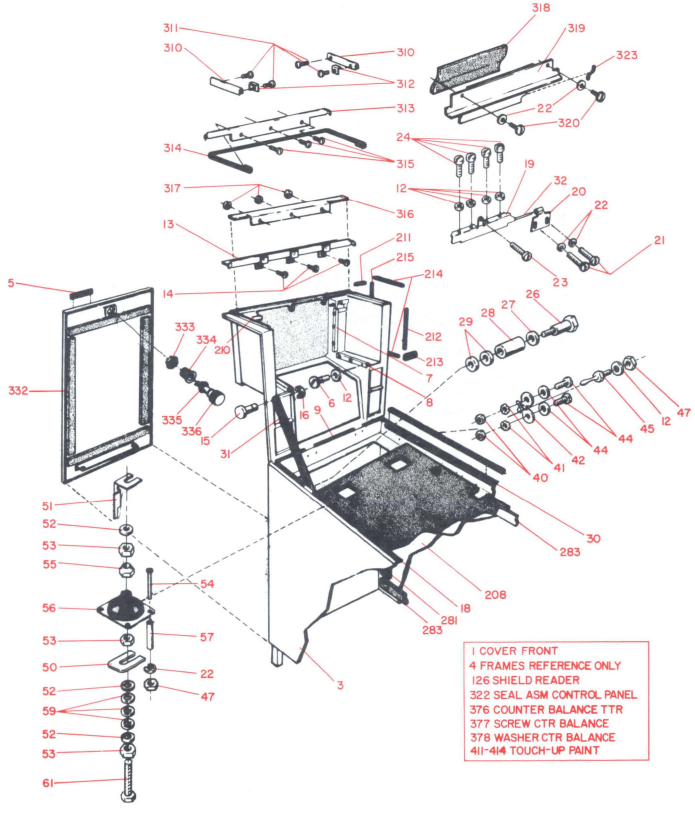
CONTROL PANEL & SWITCHES

MECH. CODE 86



COVERS & MOUNTING

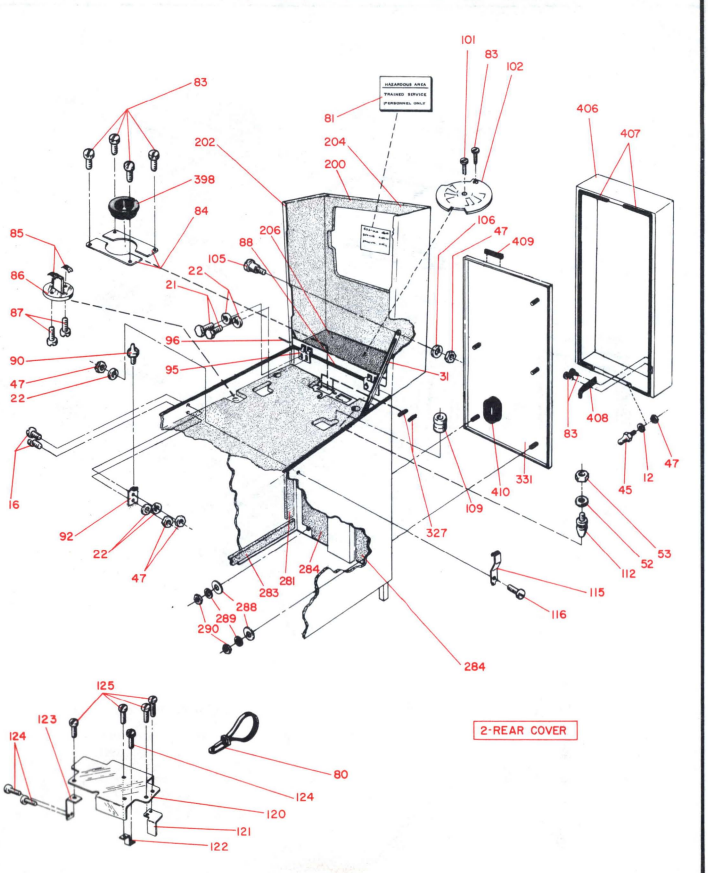
MECH. CODE 87



1 COVER FRONT
4 FRAMES REFERENCE ONLY
126 SHIELD READER
322 SEAL ASM CONTROL PANEL
376 COUNTER BALANCE TTR
377 SCREW CTR BALANCE
378 WASHER CTR BALANCE
411-414 TOUCH-UP PAINT

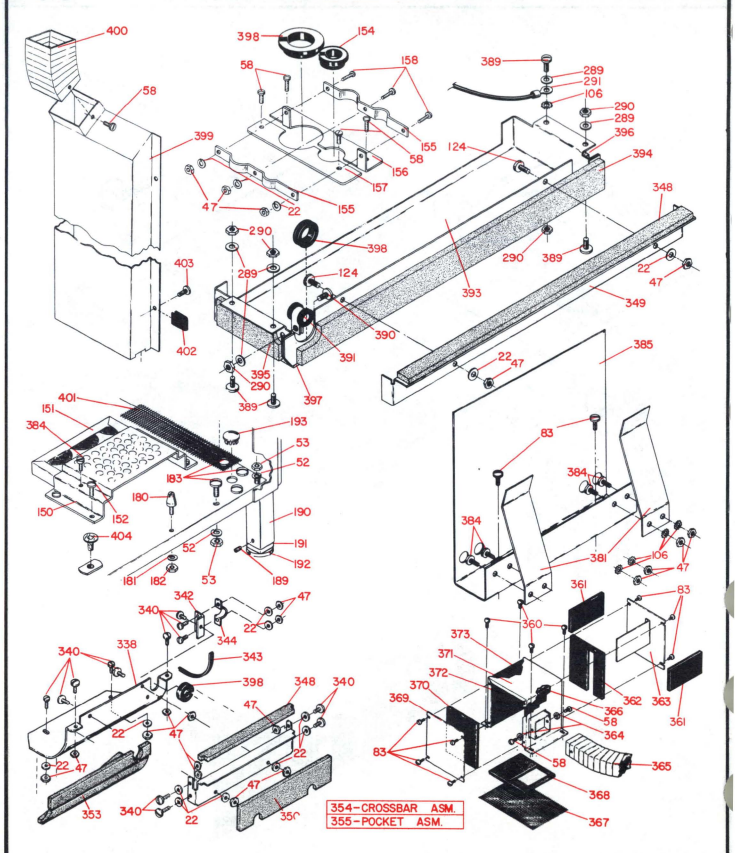
MECH. CODE 87

COVERS & MOUNTING



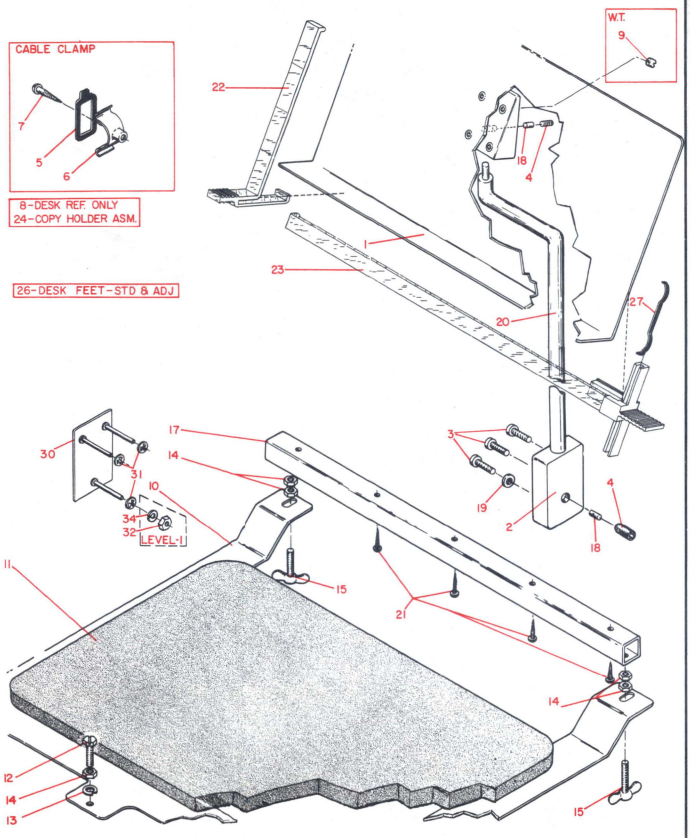
MECH. CODE 87

COVER HARDWARE



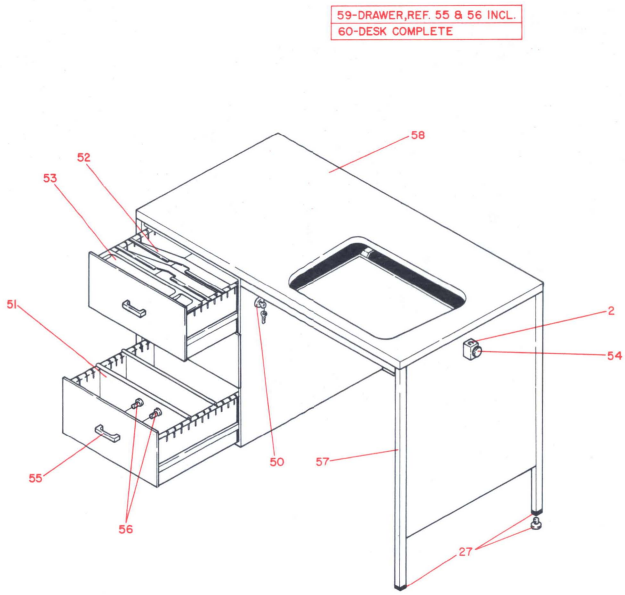
DESK HARDWARE

MECH. CODE 88



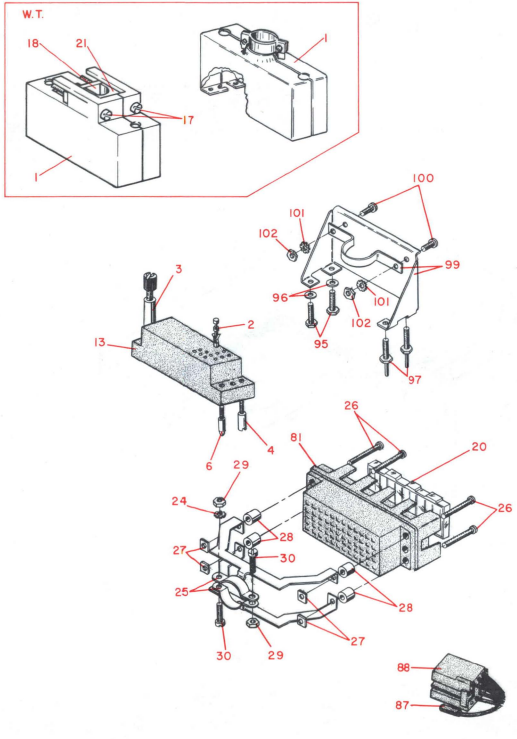
W.T. TYPING DESK PARTS

MECH. CODE 88



MECH. CODE
89

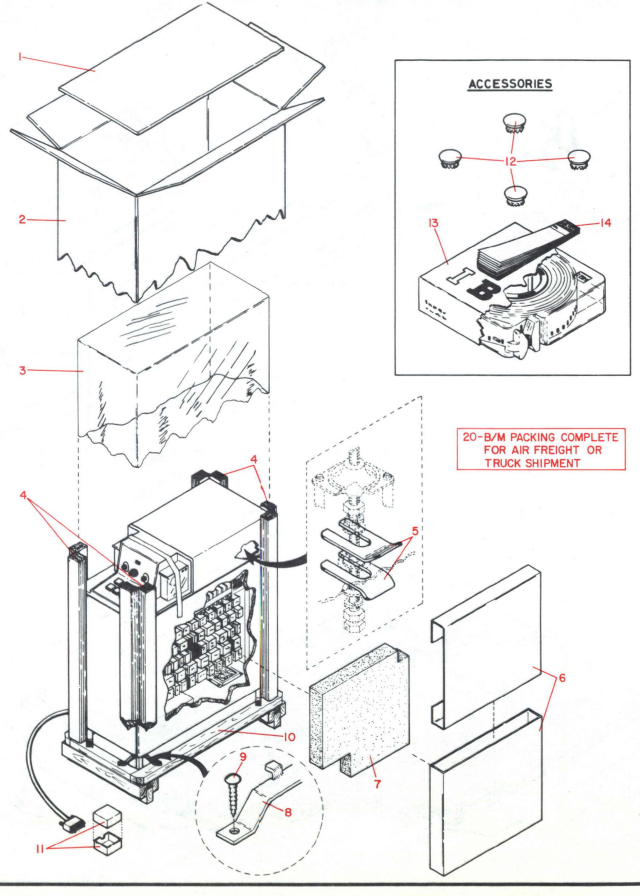
CABLE ASSEMBLIES



40-CABLE CLAMP B/M
60-CABLE ASM. MT/ST

MECH. CODE
90

W.T. UNIT PACKING



CAUSE OF FAILURE	CODE	CAUSE OF FAILURE	CODE
Bent/Warped	01	Stripped	15
Binding/Sticking	02	Wiring Defects	16
Broken/Cracked	03	Weak	17
Burned/Pitted/Burred	04	Worn	18
Card/Tape Jam	05	No Trouble Found	19
Dirty/Corroded	06	Other	20
Loose/Solder Conn.	07	Standby	21
Lubrication	08	Operator Preference*	22
Noise (Mech.)	09	Sound Distortion	23
Off/Off Registration	10	Beat The Operation	24
Open	11	Flicking	25
Out of Adjustment	12	Operator Error	26
Out of Alignment	13	Noise Electrical	27
Shorted/Grounded	14	Low Contrast	28

**Operator Preference — Adjustment due to operator opinion which is not a malfunction of the machine.*

MODEL CODES
705 – MT/ST I/O Remote Record W/Fabric Ribbon
731 – "Selectric" I/O 11"
735 – "Selectric" I/O 15"
745 – First Stage "Selectric" I/O (No Contact, Magnets, Wiring Harness Or Covers)
775 – MT/ST I/O W/Fabric Ribbon
785 – MT/ST I/O W/Film Ribbon
795 – MT/ST I/O Remote Record W/Film Ribbon
1011 – Single Station MT/ST
1013 – Single Station Remote Record MT/ST
1021 – Two Station MT/ST
1023 – Two Station Remote Record MT/ST
6330 – Model V MT/SR
6511 – Model VI Schools MT/ST

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Office Products Division
Customer Engineering

Form No. 241-5990-0

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