37 NONTYPING REPERFORATOR

YRPE808 AND 809

DESCRIPTION AND PRINCIPLES OF OPERATION

CONTENTS PAGE

1. GENERAL

1.01 This section provides the description and principles of operation for the late design 37 nontyping reperforator (Figure 1). For information concerning adjustments refer to Section 574-329-703, for lubrication Section 574-329-704, and for disassembly and reassembly Section 574-329-705.

1.02 The nontyping reperforator is an electromechanical device that records information in tape as combinations of code holes for each of the eight levels of intelligence. The information is translated into mechanical motions to perforate the code holes and feed the tape, and conforms with ASCII (American National Standard Code for Information Interchange). The reperforator derives its motive power externally, and operates at 150 wpm.

1.03 Character representations, or graphics, are the alphabetic, numeral or symbol intelligence representations. Function representations are the coded equivalent of operations auxiliary to transmission or reception of the graphics, such as carriage return, line feed, or signal bell. Both character and function representations are perforated into the tape.

1.04 The unit is considered idling when the main shaft is turning and the signal circuit is closed. The unit is running open when the main shaft is turning and no signal is applied to the selector magnets.

1.05 References to left or right, front or rear, top or bottom apply to the reperforator when facing the punch block.

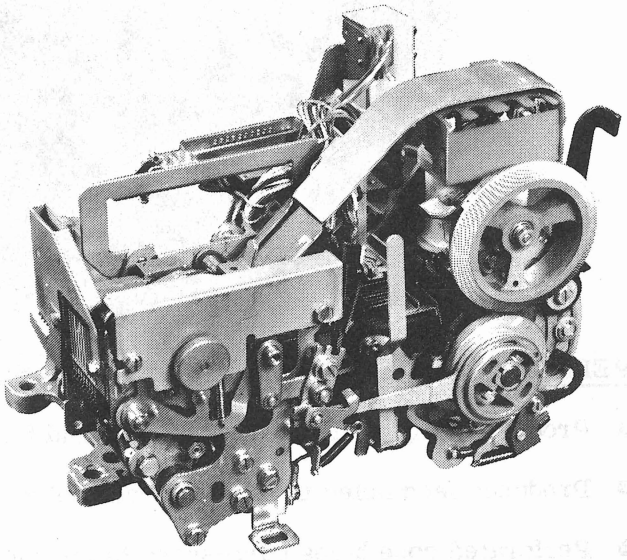


Figure 1 - 37 Nontyping Reperforator

Prepared for American Telephone and Telegraph Company by Teletype Corporation

2. DESCRIPTION

BASIC UNIT

2.01 The basic reperforator (Figures 2 and 3) consists of the selector, transfer, function, and perforator mechanisms. The selector mechanism includes a 2-coil magnet, a selecting cam sleeve, and a range finder. The range finder permits adjustment of the selector mechanism in relation to the signal code. Figure 4 is a block diagram of the basic unit.

2.02 Rotary motion from an external source is received by the main shaft and distributed by the 2-cycle cam and clutch assembly. Although the reperforator operates at 150 wpm, it can be optionally geared for 100 wpm. These speeds are determined by the gearset on the main shaft. The rocker bail further extends the mechanical power to the perforator mechanism.

2.03 Information is presented to the selector in the form of sequential mark and space pulses. These electrical pulses are converted

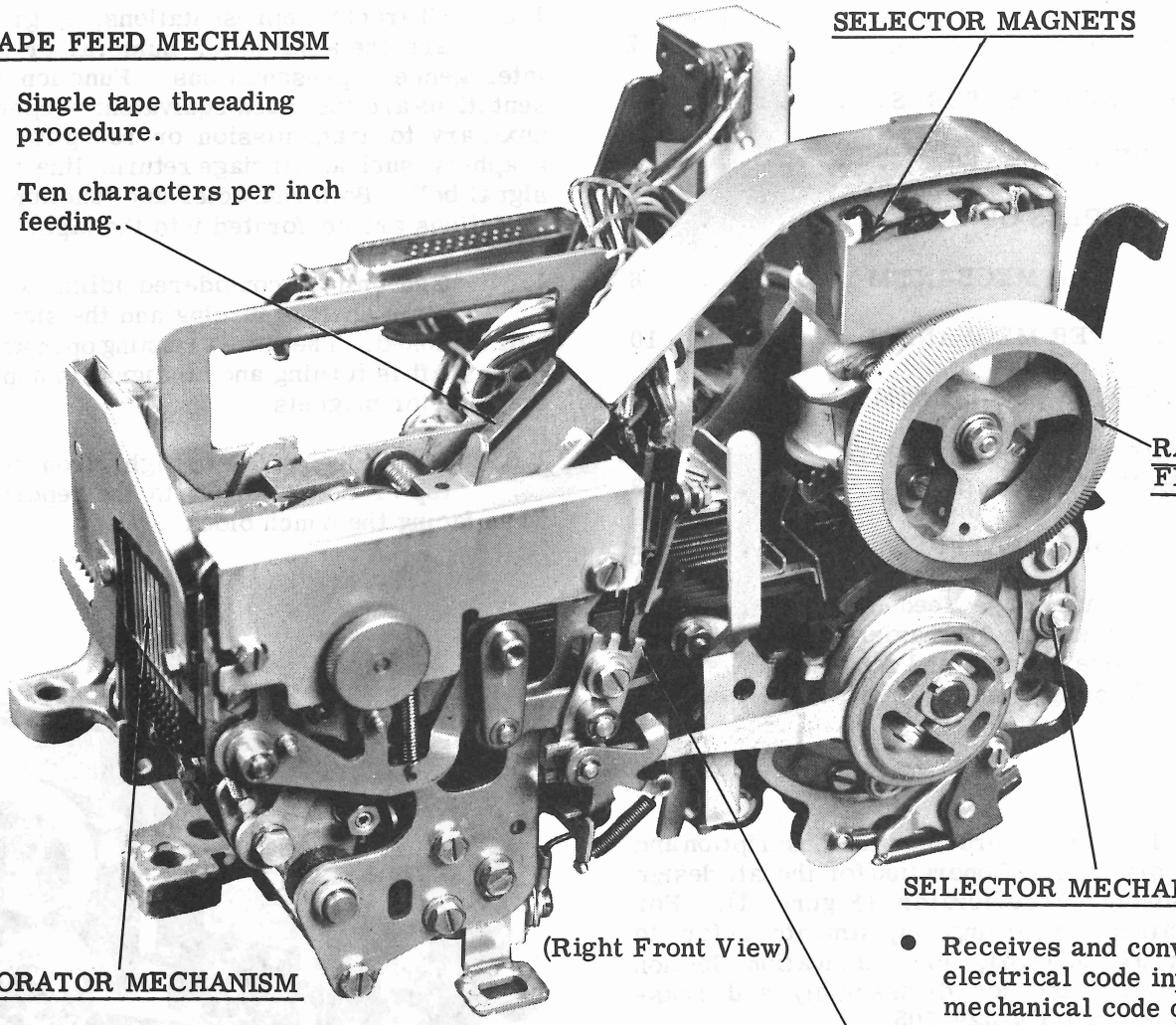
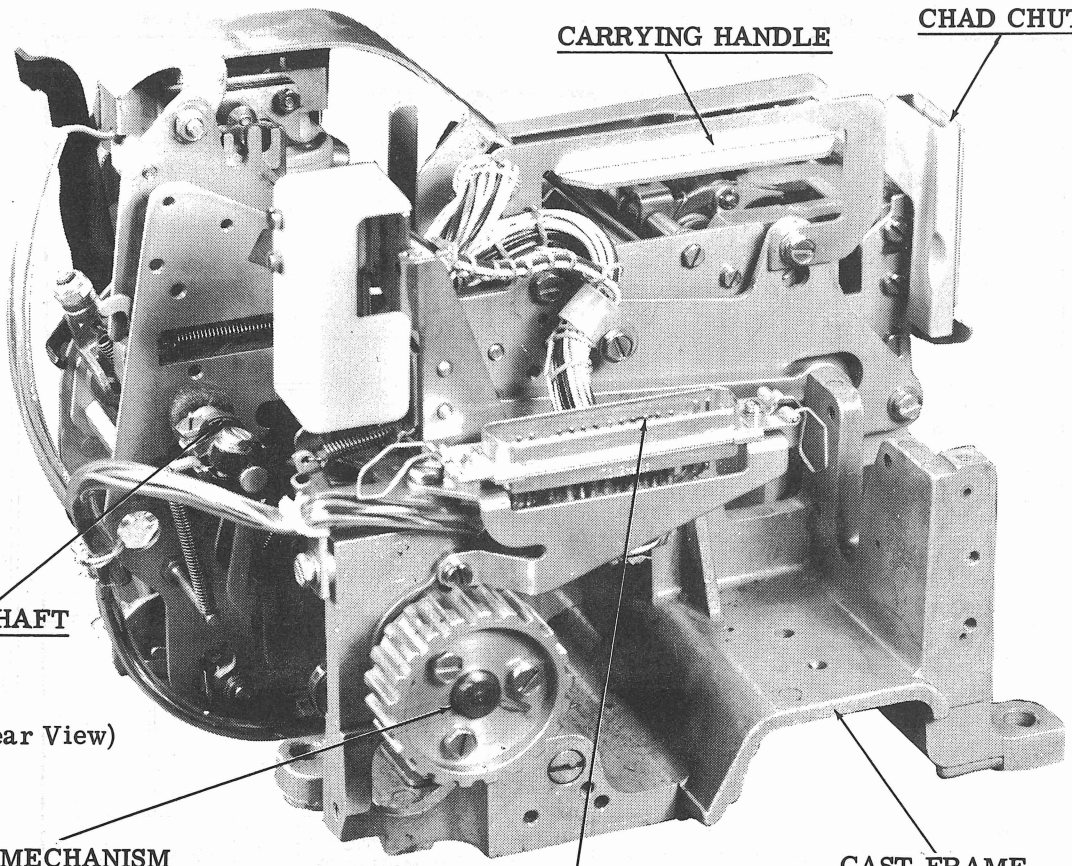


Figure 2 - 37 Nontyping Reperforator



- Transfers rotating motion from external source to unit.
- External gears permit unit to operate at speeds to 150 wpm.

- Interconnects unit with external circuits.

- Provides mounting facilities for perforator mechanisms and accessories.
- Permits installation on base.

Figure 3 - 37 Nontyping Reperforator

to mechanical motions which are transferred to the perforator. The parallel output motions of the selector are transferred through a combination of cams, levers, and linkages.

2.04 The cast frame assembly provides mounting facilities for the various mechanisms which comprise the reperforator. The frame is mounted on the related equipment that provides motive power for the reperforator. One connector is provided on the side of the unit for all electrical input requirements.

Selector Mechanism

2.05 The selector mechanism receives an electrical coded input and converts it, through a trip assembly, to a mechanical coded output. The selector mechanism includes magnet coils and armature; selector cam and clutch; and associated levers, arms, and bails.

Transfer Mechanism

2.06 The transfer mechanism transfers the signal intelligence from the selector mechanism to the perforator mechanism.

Function Mechanism

2.07 The function mechanism includes a trip assembly, cam-clutch, and rocker bail. It transfers timed motion to the perforator mechanism. The function cam-clutch is tripped by the selector mechanism. It drives the rocker bail which transmits power to the perforator

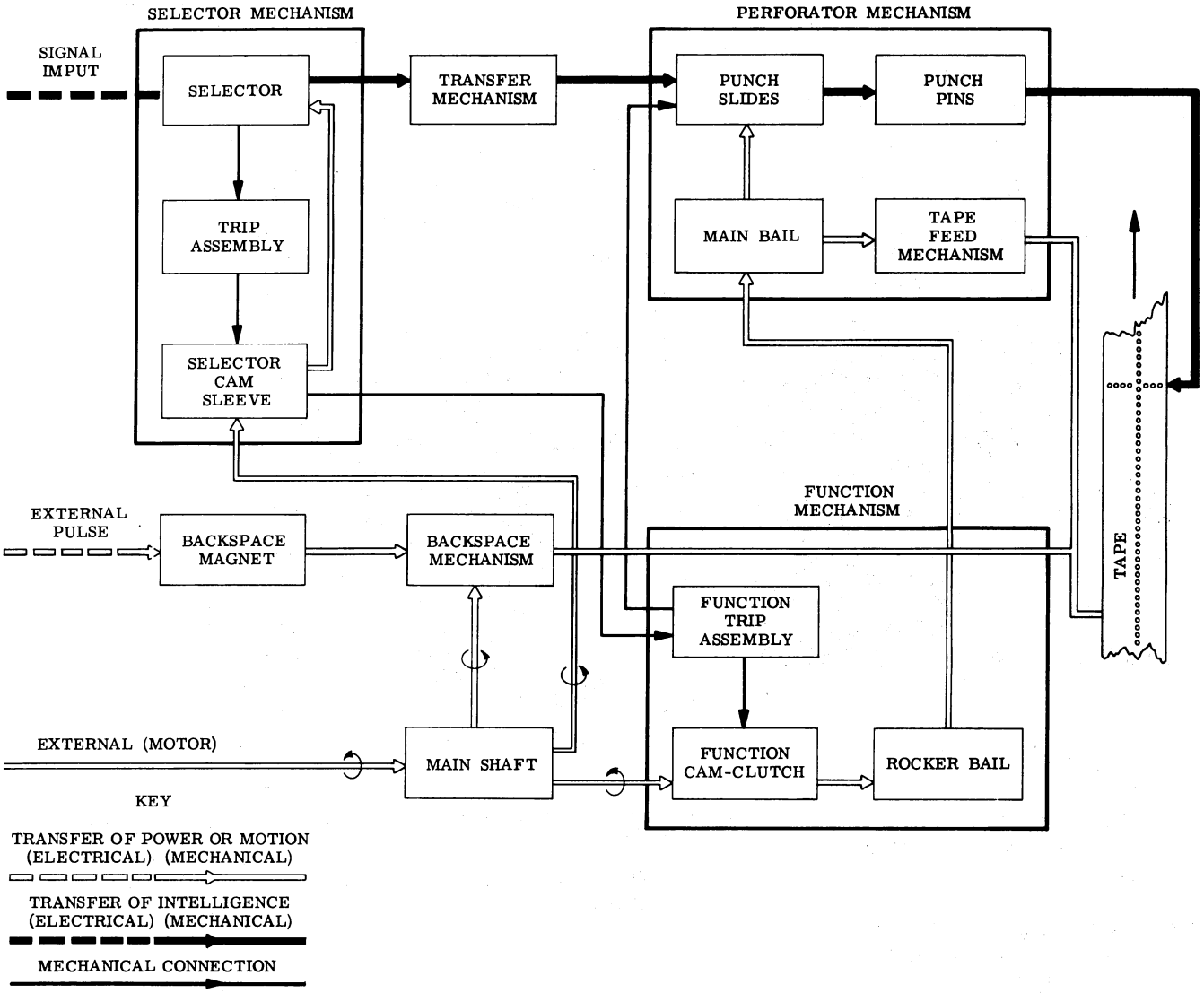


Figure 4 - Block Diagram of Nontyping Reperforator

mechanism through the perforator drive link and rocker arm.

Perforator Mechanism

2.08 The perforator mechanism contains a punch block, punch pins and drive parts. The punch pins, contained within the punch block, punch fully perforated code holes in the tape in response to the selector mechanism, via punch slides and punch slide latches. A feed hole is perforated on each cycle of operation.

VARIABLE FEATURES

2.09 A number of variable features are available with the basic reperforator. These features enable the unit to perform special operations and may be installed either at the factory or in the field. The following is a list of these variable features:

- Tape feed-out (delete)
- Backspace
- Code reading contacts
- Character received contacts

Tape Feed-Out

2.10 The tape feed-out feature enables the operator to insert a fill character (delete) to be used for leaders, tape splicing, timing, and spacing. Tape feed-out can be either manual or magnet operated. Manual feed-out is provided by a lever that trips the selector mechanism to perforate "delete" tape. Magnet operated feed-

out provides a nonmetered amount of tape perforated with the delete code. This is done by depressing the REPEAT and DELETE keys on the keyboard or the FEED OUT key on the ROTR or RT set.

Backspace

2.11 The backspace mechanism for units containing Model 37 reperforators is capable of reversing the normal motion of the fully perforated tape. This mechanism can backspace up to twelve characters with any fully perforated tape.

2.12 The purpose of backspacing tape is to delete errors by overpunching the individual character perforations by means of the delete code. The power drive assembly provides for remote control of the backspace mechanism.

Code Reading Contacts

2.13 Code reading contacts are located in front of the selector pushbars and they read parallel signals from the serial signals received by the selector. The purpose of these contacts is to read the code combination being perforated. It has a bank of eight transfer-type contacts (break-before-make) associated with a punch slide. These code reading contacts condition the circuit and work in conjunction with other switches to perform a function. The code reading contacts are wired to a 50-pin connector and mounted to an adjustable mounting bracket which in turn is mounted to an adjustable mounting frame.

Character Received Contacts

2.14 Character received contacts are connected to external circuits as defined by customer's system requirements. These contacts are available in normally open or normally closed arrangements located on the selector mechanism.

TECHNICAL DATA

2.15 Physical Characteristics

(a) Dimensions

Width	6-1/2 inches
Length	7-1/2 inches
Height	6 inches
Weight (less motor and base)	6-1/2 pounds

(b) Tape

Type	Standard communications and ASCII
Width	1 inch
Perforations	8-level, fully perforated
Holes/inch	10
Feed Holes	In line with code holes

(c) Temperature ranges

This equipment is intended to be operated in a room environment within the temperature range of 40°F to 110°F. Serious damage to it could result if this range is exceeded. In this connection, particular caution should be exercised in using acoustical or other enclosures.

3. PRINCIPLES OF OPERATION

3.01 Rotary motion from an external source is applied to the main shaft which turns constantly as long as the unit is under power.

3.02 The serial signal code input is applied electrically to the selector mechanism. The start pulse of each code combination causes the selector, through a trip assembly, to trip the selector cam sleeve. The main shaft then imparts motion to the cam sleeve throughout the selecting cycle. The selector cam sleeve, in turn, transfers timed motion to the selector, which converts the intelligence bits of the code combination into a corresponding mechanical arrangement. Near the end of the selecting cycle, the cam sleeve actuates the function trip assembly which trips the function cam-clutch and releases the punch slides of the perforating mechanism so they can receive the code arrangement from the selector via the transfer mechanism. The selector cam sleeve is then disengaged and remains inoperative until the next code combination is received.

3.03 The function cam-clutch, driven by the main shaft, imparts motion to the rocker bail throughout the function cycle. The rocker bail transfers the motion to the perforator main bail which, in turn, distributes it to the punch slides and the tape feed mechanism. The punch slides, having received the arrangement from the selector mechanism, cause the punch pins to perforate code holes in the tape corresponding to the code pulses received by the selector mechanism.

3.04 Late in the function cycle, the tape feed mechanism advances the tape one character space. The function cam-clutch is then disengaged and remains stationary until again tripped by the selector cam sleeve. The operations of the reperforator may overlap if the code combinations are being received fast enough. For example, while the perforating mechanism is punching the code combination and advancing the tape, the selector mechanism may be processing the next code combination.

3.05 Pulsing the backspace magnet actuates the backspace mechanism which retracts the tape through the punch block.

SELECTOR MECHANISM

3.06 The selector mechanism consists of the magnet coils and armature, a selector cam and clutch, and associated levers, arms and bails necessary to convert the electrical intervals of the start-stop code to the mechanical motions which are transferred to the perforator mechanism and code contacts.

3.07 The selector clutch and cam sleeve assembly is comprised of the two-stop clutch, the start bail and lift lever cam, the eighth, seventh, sixth, fifth and fourth selector lever cams, the cam for the spacing and marking locklevers, the third, second, and the first selector lever cams, the push lever reset bail cam, and the function clutch trip cam.

3.08 During the time in which a closed line circuit (marking) condition exists, the selector magnet coils are energized and hold the selector armature against the selector magnet pole pieces. In this stop position, the selector armature blocks the start lever.

3.09 At the start of a signal for any character or function, the start (spacing) interval releases the selector armature which under tension of its spring, moves away from the magnet pole piece and, thus, unlatches the start lever. The start lever turns clockwise under the tension of its spring to move the start bail into the indent of its cam.

3.10 As the start bail rotates about its pivot point, the attached stop arm is moved out of engagement with the clutch shoe lever. The selector cam clutch engages and begins to rotate. By this time, the start lever tip has moved into the selector armature extension cut-out and the armature starts moving in correspondence with the signal bits. Between the second and third signal bit, the lift lever is pivoted clockwise by the start bail cam and lifts the start lever above the armature extension. At this same time, the start bail rides to the high point of its cam where it remains to hold the start lever away from the selector armature until late in the character cycle. In approximately the middle of the cycle the lift lever rides down its cam, thus, lowering the start lever. When the stop impulse at the end of the signal is received, the selector armature is pulled up to block the start lever. Thus, the start bail is prevented from dropping into the low part of its cam (stop position of cam sleeve, and the attached stop arm is held so as to stop the clutch shoe lever).

3.11 The selector cam clutch disc upon which the latchlever rides has an indent at each of its two stop positions. When the clutch shoe lever strikes the stop arm, the inertia of the cam disc assembly causes it to continue to turn until its lug makes contact with the lug on the clutch shoe lever. At this point, the latchlever drops into the indent in the cam disc, and the clutch is held disengaged until the next start interval is received.

3.12 The series of up to eight selecting levers and the marking and spacing locklevers ride their respective cams on the selector clutch and cam sleeve assembly. As the marking and spacing signal intervals are applied to the selector magnet, the selector cam sleeve rotates and actuates the selector levers. When a spacing interval is received, the marking locklever is blocked by the end of the armature and the spacing locklever swings toward the rear above the armature and locks it in the spacing position until the next signal transition is due. Extensions on the marking locklever prevent the selector levers from following their cams. When a marking impulse of the signal is received, the spacing locklever is blocked by the end of the armature and the marking locklever swings to the rear below the armature to lock it in the marking position until the next signal transition is due. During this marking condition the selector levers are not blocked by the marking locklever extensions, but are permitted to move against their respective cams. The selecting lever that is opposite the indent in its cam, while the armature maintains a marking condition, swings to the rear or selected position momentarily. Each selecting lever has an

associated push lever which drops off a shelf on the top of the selecting lever when it rides into its cam indent. As the cam sleeve turns, each selecting lever together with its latched push lever is moved toward the front and held there until all eight code intervals have been received. After all the selected push levers have been positioned to the front and all unselected push levers have been positioned to the rear, they are held until the next start interval is received. When the subsequent start interval again causes the cam sleeve to rotate, the push lever reset bail, in following its cam, unlatches the selected push levers. The push levers then return to the unselected (rear) position under their spring tension.

3.13 The no. 1 push lever differs in that it uses an auxiliary no. 1 push lever and auxiliary strip bail. When the no. 1 selector lever is permitted to follow its cam (marking condition) the auxiliary no. 1 push lever is selected in the same manner as other push levers. At this time the strip bail is on the high part of its cam, resetting all the selected push levers above the shelves on their associated selector levers. When the no. 1 selector lever returns counterclockwise to the intermediate position on the cam, a tab on the auxiliary no. 1 push lever engages the no. 1 push lever and drives it to the front in a marking condition. At approximately midcycle the auxiliary push lever is stripped by its auxiliary strip bail, thus, the auxiliary no. 1 push lever is prepared for the next incoming marking pulse. The auxiliary lever action permits normal strip operation to occur between no. 1 and no. 2 pulse selection.

3.14 The selector cam sleeve clutch has two stop positions and likewise the individual cams have two complete identical contours in 360 degrees, providing for two complete cycles of operation for each revolution of the cam sleeve.

Note: When rotating the main shaft by hand, the clutches will not fully disengage upon reaching the stop position. In order to relieve the drag on the clutch and permit the main shaft to rotate freely, apply pressure on the lug of the clutch disc to cause it to engage its latchlever. This procedure should be followed prior to applying power to the unit.

Manual Operation of the Unit

3.15 While adjustments are being made, apply current to the selector coils, holding the selector magnet armature in the marking position. To manually select an all marking combination, push the armature downward into the spacing position momentarily to permit the selector clutch to engage. Rotate the main shaft slowly through a half revolution. Fully disengage the clutch as prescribed in the preceding note and repeat if desired.

Start-Stop Operation (Figure 5)

3.16 Engage-disengage selector cam sleeve with main shaft; responds to start and stop bits of a character.

Operation

Engage selector cam sleeve with main shaft.

(1) Start (spacing) bit of new character de-energizes selector magnets and releases armature.
(2) Armature, under tension of armature spring, falls against downstop bracket.
(3) Absence of armature extension unlatches start lever which, under tension of start lever spring, pivots inward moving the stop arm bail into the indent of its cam. As the stop arm bail pivots inward, the attached stop arm pivots out of path of clutch shoe lever.
(4) Clutch shoe levers expand to engage disc and cam sleeve assembly with rotating clutch drum.

Raise, reset, and lower start lever. Block clutch shoe lever.

(1) Cam sleeve starts rotating. Selector cam sleeve mechanically operates its cam followers in a prearranged sequence as code level signals (marking or spacing) operate the armature.
(2) Between the second and third character bit, lift lever elevates start lever above opening in armature extension. Stop arm bail rides to high part of stop arm cam forcing start lever away from armature, restoring stop arm to blocking position.

Disengage selector cam sleeve from main shaft.

(1) Lift lever falls into indent of stop arm cam and lowers start lever.

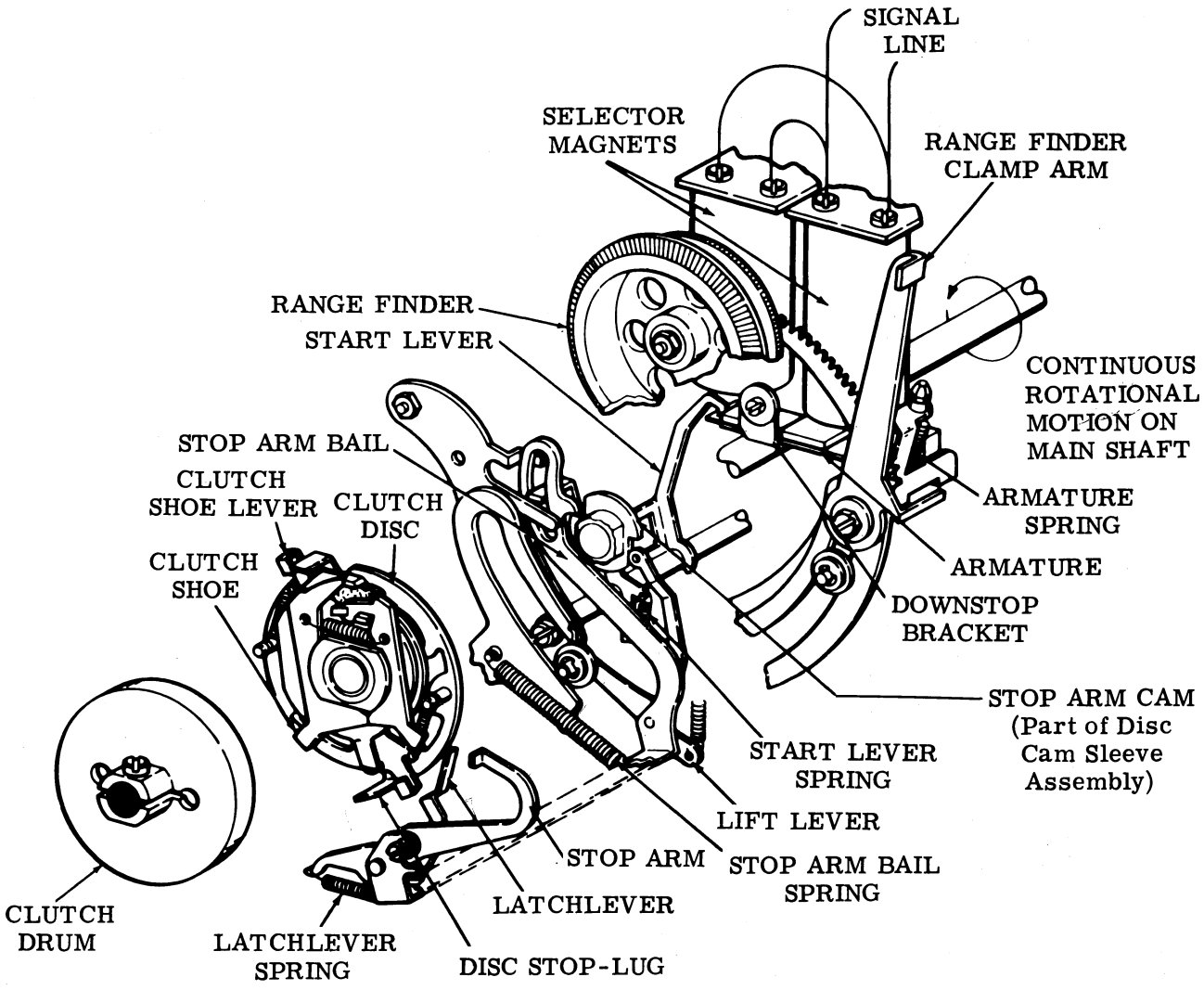


Figure 5 - Selector Start-Stop Operation

(2) Stop (marking) bit at end of character energizes selector magnets and attracts armature.
(3) Stop arm cam presents indent to stop arm bail.
(4) Stop arm bail begins to enter indent, but is prevented from entering fully by start lever whose inward movement is blocked by armature extension. Stop arm engages shoe lever to disengage cam sleeve from rotating clutch drum.
(5) Clutch disc latched by latchlever.
(6) Selector mechanism prepared to receive start (spacing) bit of subsequent character.

Push Lever Reset (Figure 6)

3.17 Strip the previous character from push levers after a start bit causes the selector cam sleeve to engage the main shaft.

Operation

As cam sleeve begins rotating, high part of push lever reset bail cam lifts push lever reset bail against tension of spring. Bail pivots, lifting and unlatching the marking push levers from in front of their selector levers. The bail returns to the unoperated position when the lobe drops from the high part of the cam. All of the push levers, except the auxiliary push lever, will then be in the spacing condition.

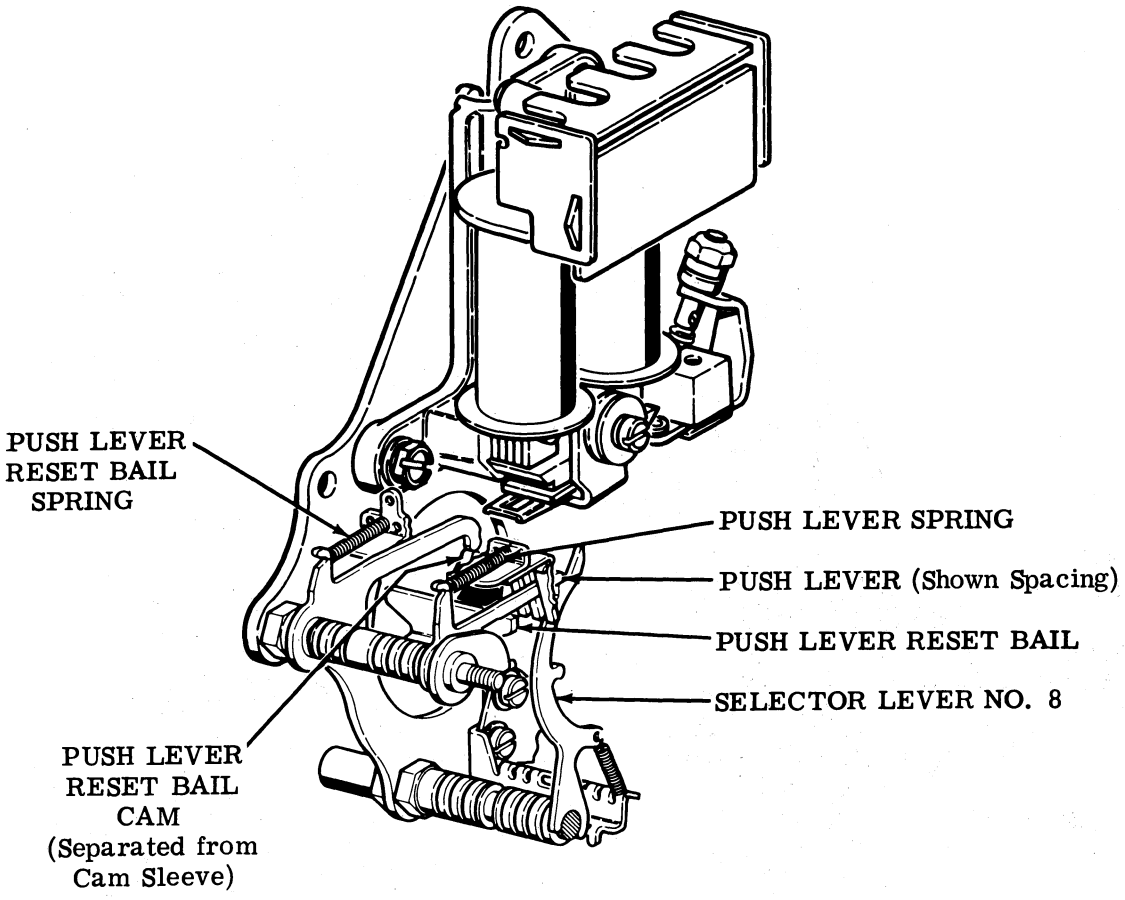


Figure 6 - Selector Push Lever Reset

Selection (Figure 7)

3.18 Code selections are performed by sequentially positioning push levers as marking and spacing intervals are applied to selector magnets.

Operation

View (A) - Idle Condition

(1) Selector cam sleeve shown before starting selection cycle. Marking locklever, spacing locklever, and eight selector levers held against cam sleeve by their individual springs; the lobes of each lever are riding on high part of selector cam sleeve.

(2) As marking and spacing signal intervals are applied to selector magnets, selector cam sleeve rotates and actuates selector levers.

View (B) - Marking Condition

(1) When marking impulse is received, the spacing locklever is blocked by end of armature. Top of marking locklever moves under armature, supporting armature in marking position until next signal transition is due.

(2) During marking condition, selector levers are not blocked by armature extensions, but are permitted to ride against their respective cams. Only that selector lever which is opposite the indent in its cam, can affect its push lever.

(3) As the lobe of the selector lever is drawn into its cam indent, the push lever drops off the shelf of its selector lever. When the selector lever is forced out of its indent, the selected push lever slides to the marking position.

View (C) - Spacing Condition

(1) When spacing interval is received, the marking locklever is blocked by end of armature. Spacing locklever swings above armature and locks it in the spacing position until next signal transition is due.

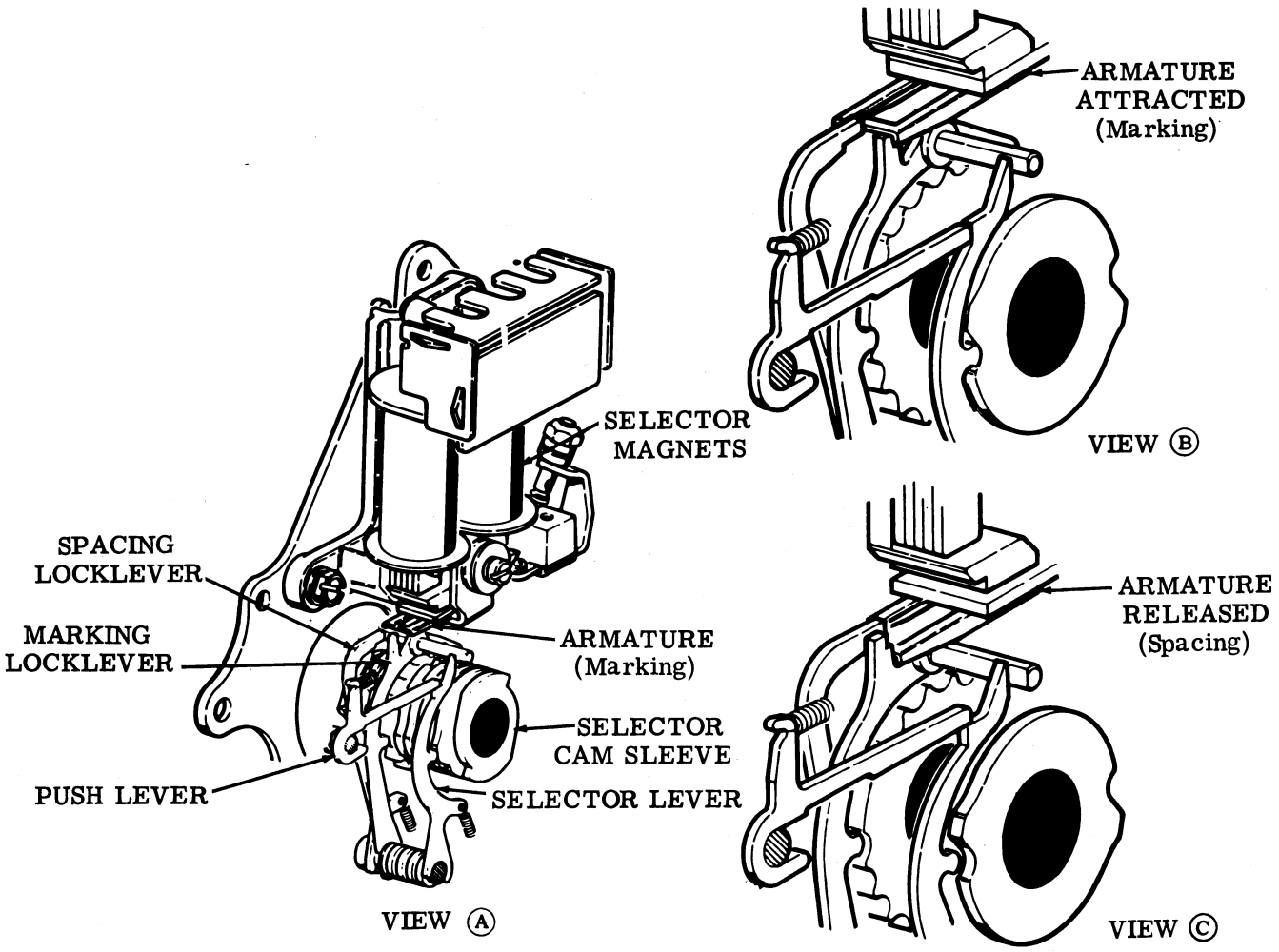


Figure 7 - Selector Operation

(2) During spacing condition, selector levers are prevented from riding their respective cams by extensions on marking lock lever.

(3) Lobe of selector lever opposite its cam indent cannot enter indent fully. Push lever will not latch in front of selector lever, but will remain on shelf.

Auxiliary Push Lever (Figure 8)

3.19 Auxiliary push levers sense marking or spacing position of selector lever no. 1. Normal strip operation (push lever reset) occurs during reception of code bit no. 1 and does not permit push lever no. 1 to sense position of its selector lever.

Operation

Auxiliary push lever responds to marking impulse for push lever no. 1. When bit no. 1 is marking, auxiliary push lever drops in front of shoulder of selector lever as push lever no. 1 is stripped. Tab on auxiliary push lever carries push lever no. 1 to marking position. When push lever reset bail returns to its unoperated position, push lever no. 1 is in front of, but not touching, its selector lever. About half way through the selection cycle, the auxiliary push lever is stripped by the auxiliary reset lever. Push lever no. 1 is then latched by selector lever no. 1.

TRANSFER MECHANISM (Figure 9)

3.20 The purpose of the transfer mechanism is to provide a path for the signal intelligence from the selector mechanism to the punch slides in the perforator mechanism.

Operation

Selected push levers, in moving to the left as determined by their respective cams, rotate associated punch slide latches coun-

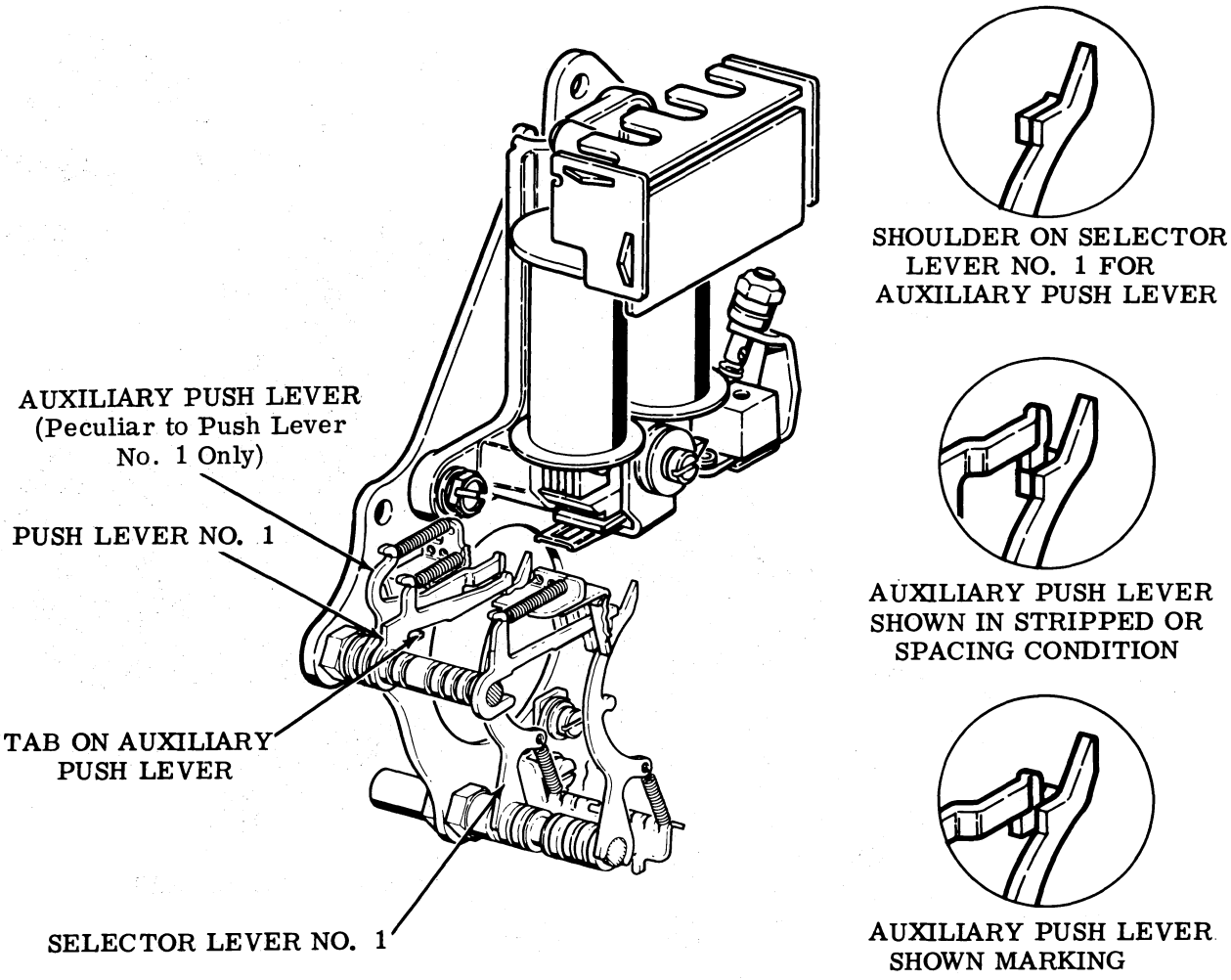


Figure 8 - Selector Auxiliary Push Lever

terclockwise. Just before the eighth push lever is selected, the selecting cam through the function trip assembly carries the perforator reset bail to release the punch slides. Unselected latches retain their associated slides to the right while the selected latches permit their slides to move to the left under spring tension. During the latter part of the function cycle, the reset bail returns the punch slides to their unselected position. The latches return under spring tension to their unselected position when the push levers are repositioned at the start of the next selection cycle.

FUNCTION MECHANISM (Figure 10)

3.21 The purpose of the function mechanism is to convey timed and controlled motion from the selector mechanism to the punch slides in the perforator mechanism.

3.22 Main shaft motion is conveyed to the perforator mechanism by the function mechanism, comprised of the cam-clutch, rocker bail and a clutch trip assembly. A follower lever rides on the function clutch trip cam which is part of the selector cam sleeve. Near the end of the selecting cycle, as the main shaft rotates counterclockwise, the high part of the cam pivots the follower lever which, through an attached adjusting arm, rotates the main trip lever counterclockwise. The reset bail trip lever attached to the main trip lever lowers the perforator reset bail and releases the punch slides, and the upper arm of the main trip lever moves away from the clutch release, which falls against the down-stop and rotates the trip shaft counterclockwise. Immediately, the low part of the trip cam allows the follower lever to return to its unoperated position, and the upper arm of the main trip lever moves down against the release. When the trip shaft is rotated by the

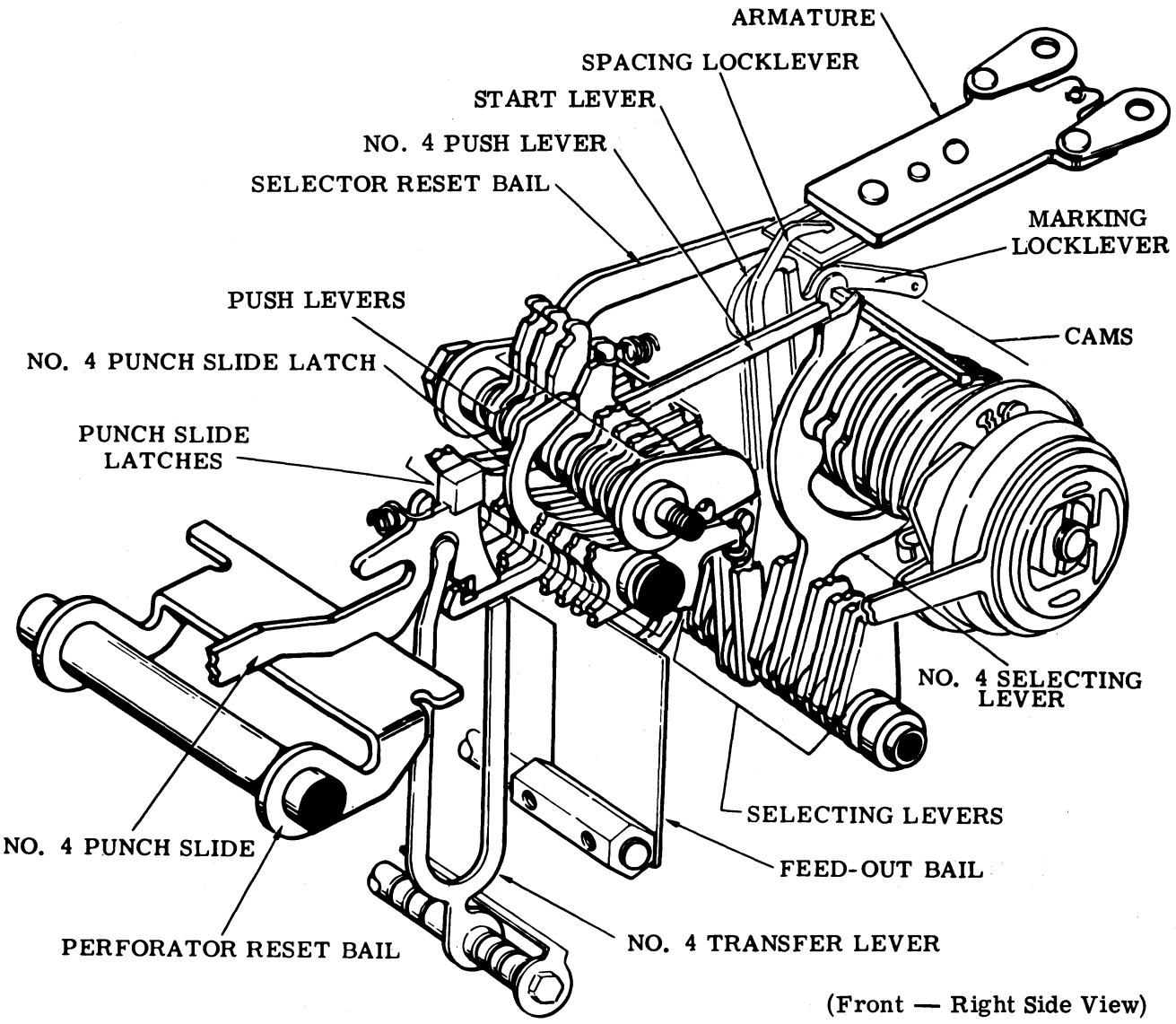


Figure 9 - Selector and Transfer Operation

release, it moves an attached clutch trip lever out of engagement with the clutch shoe lever. The clutch engages, and the cam-clutch begins its cycle.

3.23 The function cam and the rocker bail translate the rotation of the shaft into simple harmonic motion which the rocker bail transfers to the perforator mechanism.

3.24 Each function cycle, the function cams bear against the upper and lower rollers and causes the rocker bail to rock to the left during the first part of the cycle, and then back to its home position during the latter part of the cycle.

3.25 About midway through the function cycle, an eccentric pin on the function cam lifts the reset arm, which rotates the trip shaft clockwise. The release is moved up and allows the main trip lever to fall against the adjusting arm and raise the reset bail. The eccentric pin then moves out from under the reset arm, and the release is permitted to return to its unoperated position against the main trip lever. When the cam-clutch assembly completes its cycle, the clutch shoe lever strikes the trip lever, and the clutch is disengaged.

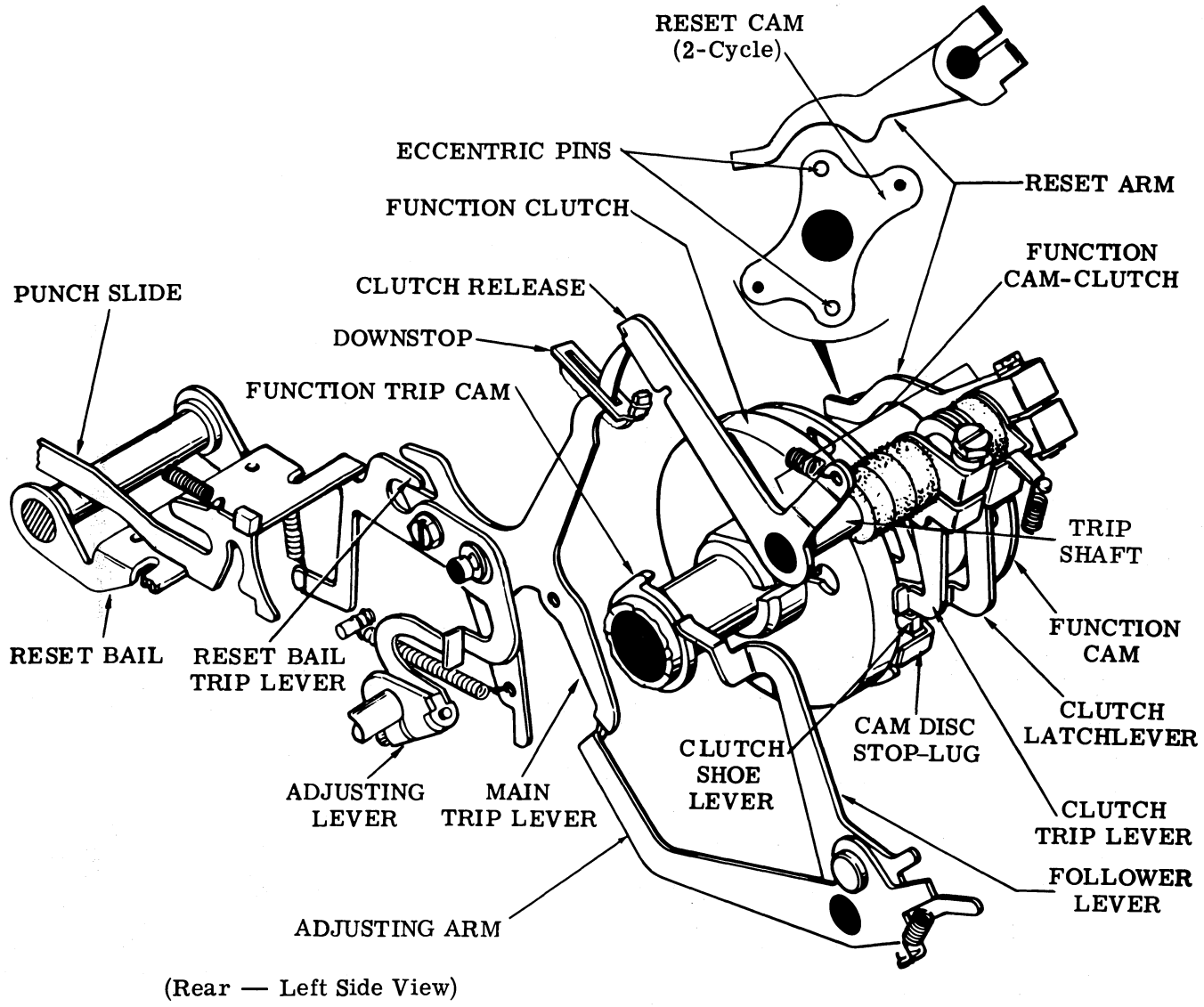
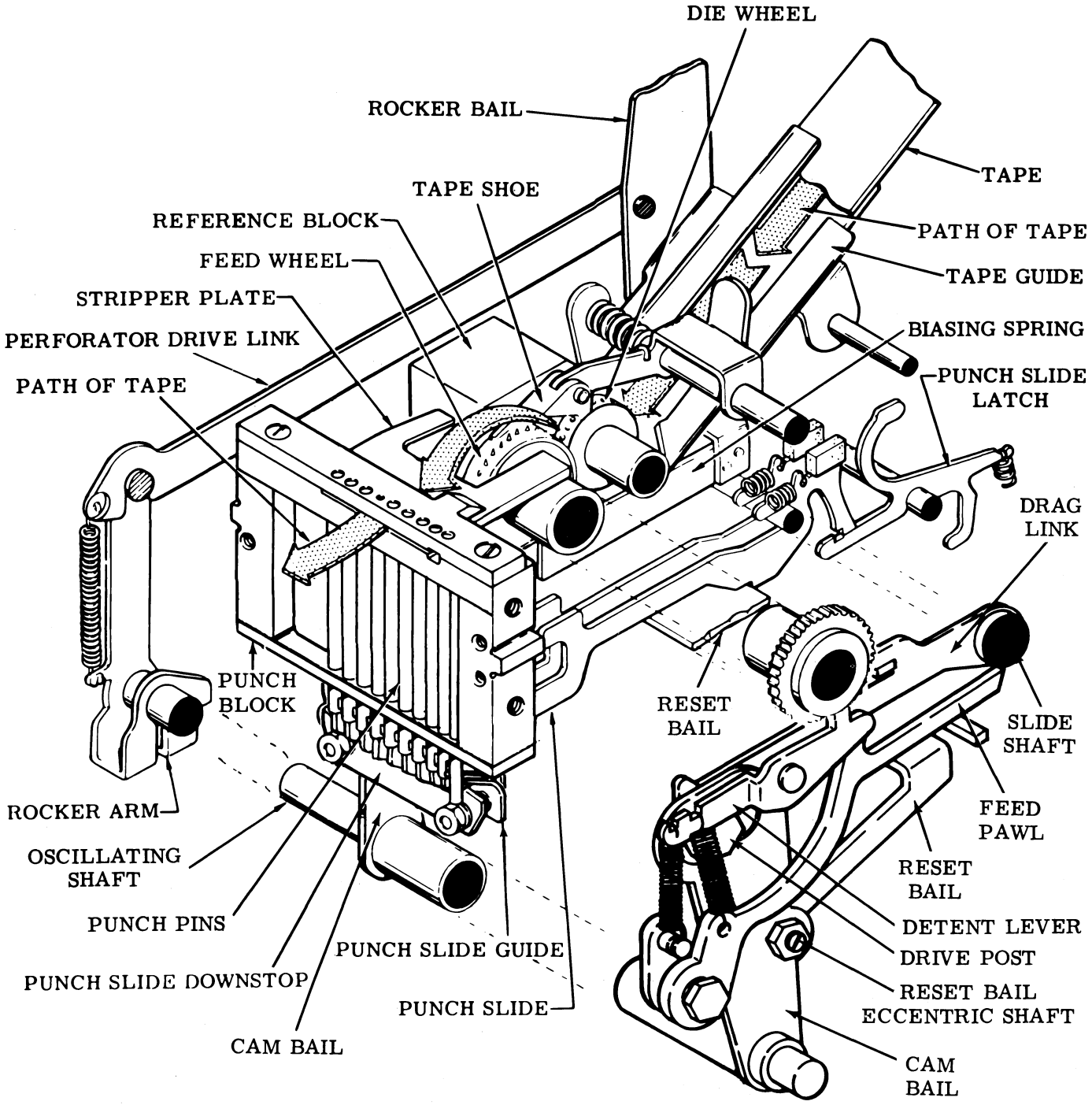


Figure 10 - Function Cam-Clutch and Clutch Trip Assembly

PERFORATOR AND FEED MECHANISM (Figure 11)

3.26 The purpose of the perforator and tape feeding mechanisms is to translate the motion received from the function mechanism into feed holes and code holes in the tape.

3.27 The perforator mechanism rolls the tape between a feed wheel and a die wheel which does not perforate the feed hole, but merely regulates the amount of tape feed. The punch perforates round holes corresponding to the code combinations received from the signal line, and perforates a smaller feed hole positioned between the third and fourth intelligence levels. Intelligence is received from the transfer mechanism by the punch slides, which select the proper punch pins in the punch block assembly. Motion from the rocker bail is distributed to the pins and the tape feed parts by the main bail assembly, which includes the cam bail, oscillating shaft, drive post, drag links, punch slide reset bail, and eccentric shaft. Near the end of the selecting cycle the reset bail is lowered and releases the eight punch slides. The selected slides move to the left, and the unselected slides are retained to the right by their latches. In the selected position, a projection of each slide extends over the slide post. Since a feed hole is perforated every operation, the punch slide associated with the feed hole punch pin is designed so that it is always in a selected position. During the first part of the function cycle, the rocker



(Right Front View)

Figure 11 - Perforator and Feed Mechanism

bail moves to the left and, by means of a drive link and rocker arm, rotates the oscillating shaft and bail counterclockwise. The cam bail attached to the right side of the oscillating shaft lifts the drive post and moves the reset bail to the front. The selected slides are carried upward by the post and force the associated pins through the tape. The slides, thus, become an integral part of the main bail assembly during the perforating stroke. Approximately midway through the function cycle, the function trip assembly lifts the reset bail.

3.28 During the last half of the cycle, the cam bail is rotated clockwise, pulling the slide post down and lowering the selected punch slides. The punch slides, which engage notches in their respective punch pins, pull the punch pins down below the tape. The main bail assembly and the selected punch slides and their associated punch pins move as a unit during the perforating stroke, both up and down. The punch pins are positively driven and retracted to produce fully perforated tape.

3.29 Tape feeding occurs after perforation during the last half of each function cycle. Tape is threaded down through the tape guide and then up between the feed wheel and die wheel. The feed pawl, driven by the cam bail, acts upon a ratchet and rotates the feed wheel which, by means of sharp pins and a slot in the die wheel, advances the tape one character at a time. A detent with a roller that rides on the ratchet holds the feed wheel and tape in position during perforation. The detent and feed pawl springs are so positioned that the pressure of the detent on the ratchet is high during the first half of the perforation, but is low during idling and the last half of the cycle to facilitate tape threading and feeding.

3.30 A tape shoe retains the tape on the feed wheel, and a biasing spring holds it back against a reference block so that the feed holes are punched a constant distance from the edge. The tape is stripped from the feed wheel by a stripper plate, passes into the punch block where it is perforated, and finally emerges through a slot in the punch block.

VARIABLE FEATURES

A. Manual Tape Feed-Out (Figure 12)

3.31 The purpose of the manual tape feed-out is to provide means for manually producing delete characters in the tape.

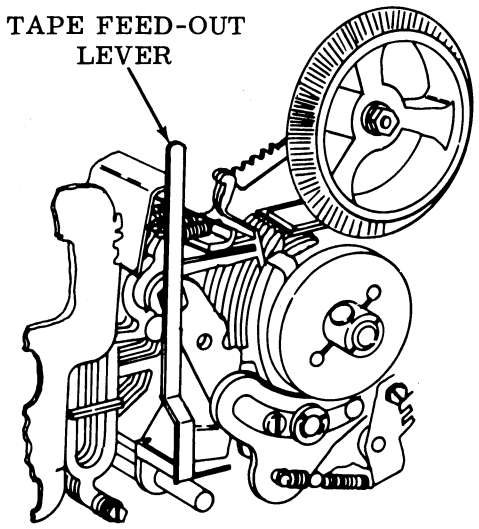


Figure 12 - Manual Tape Feed-Out

3.32 When the hand lever is operated, the manual interfering tape feed-out mechanism causes the reperforator to run open and generate delete characters and, therefore, signal inputs received during this time are not reproduced in the tape (operation interferes with signal input). The projection on the hand lever engages the lower projection on the selector start lever tripping the selector clutch. This causes the reperforator to run open and perforate delete characters in the tape until the hand lever is released.

B. Backspace Mechanism (Figure 13)

3.33 The purpose of the backspace mechanism is to retract the tape in the punch block so that errors in the tape can be deleted by overpunching.

3.34 The application of an external pulse (initiated by a BACK SPACE key on an associated keyboard unit) retracts the perforated tape one code space with each pulse. When the backspace magnet is energized, the armature bail is pulled downward. An extension on the bail disengages a drive link latch, which drops, engaging a notch on the eccentric arm. As the main shaft moves the eccentric arm to the left, the bellcrank is depressed, contacting the perforator feed pawl and disengaging it. The backspace feed pawl engages the feed wheel ratchet and rotates the feed mechanism counterclockwise. When the magnet is de-energized, the drive link is disengaged from the eccentric arm, which slides freely along the pivot post of the drive link.

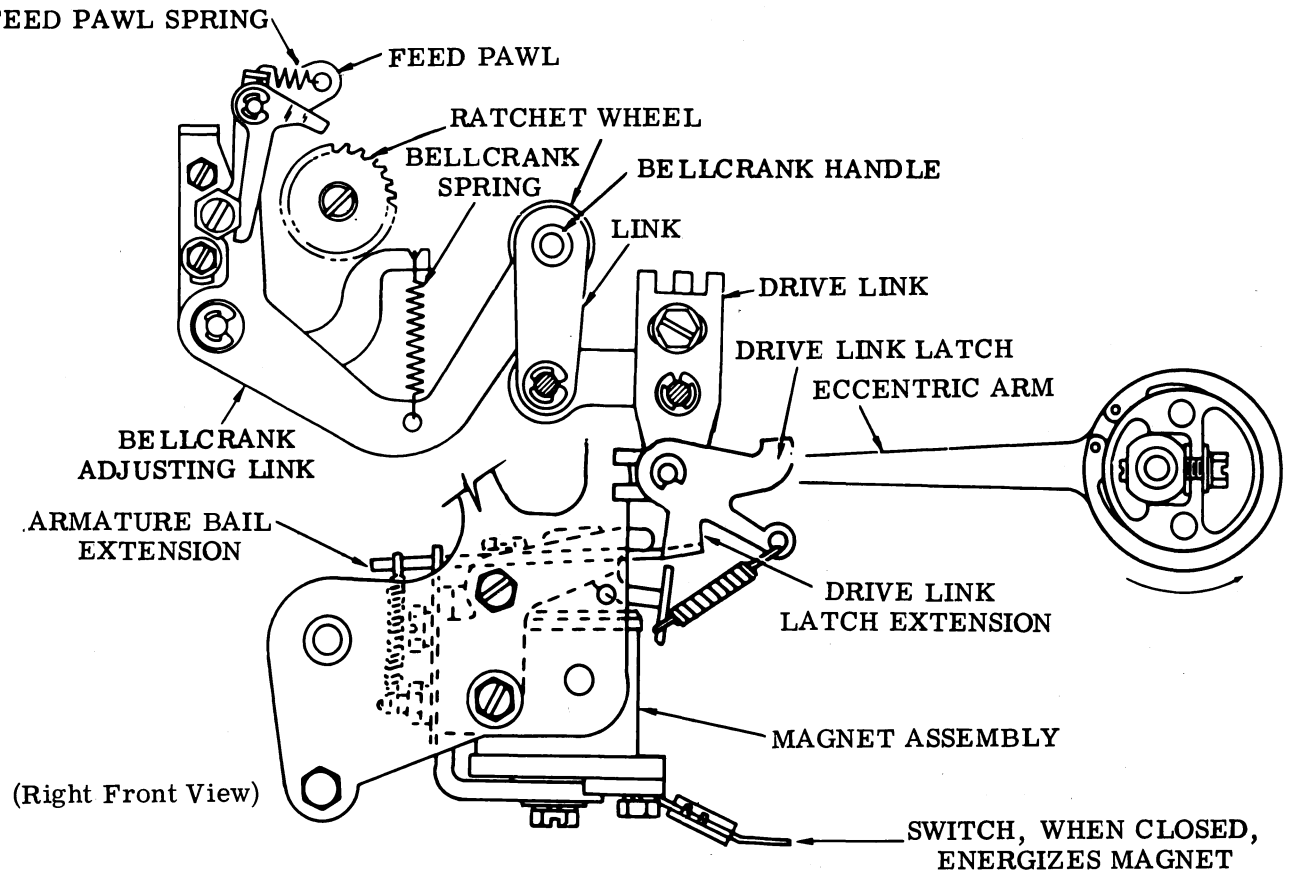


Figure 13 - Backspace Mechanism

C. Code Reading and Auxiliary Timing Contacts (Figure 14)

3.35 The purpose of the code reading contacts is to provide an electrical output corresponding to the information perforated. The auxiliary timing contact provides an electrical output for control of external equipment.

3.36 The code reading contacts are arranged in a bank of eight break-before-make transfer-type contacts operated by the corresponding punch slides. The electrical circuit for the code reading contacts is completed externally. When the reperforator is idling, the spacing position of the code reading contacts is held closed by the punch slides and the marking position held open. When the selected punch slides move into their selected position (toward the punch block) near the end of the selection cycle, the punch slides permit the contact positions to reverse. Code reading contacts associated with unselected punch slides remain in the spacing condition. In this way an electrical output is produced corresponding to the perforated information. The auxiliary timing contact is composed of a break-before-make transfer-type contact operated by a spring-operated bail in one direction and a function cam in the other direction. When the reperforator is idling, the contact closest to the mounting bracket is closed, the contact swinger is away from the backstop, and the cam follower is resting on the high part of the function cam. As the function cam rotates, the rear contact operating bail engages its swinger and operates the contact. The contact operating bail engages its swinger insulator and operates its associated contact. The swinger insulator comes to rest against its backstop and the cam follower leaves the cam.

3.37 During the second half of the function cycle, the function cam engages the cam follower and restores the contact to its idle position. These operations of the auxiliary timing contact produce electrical outputs relative to reperforator timing.

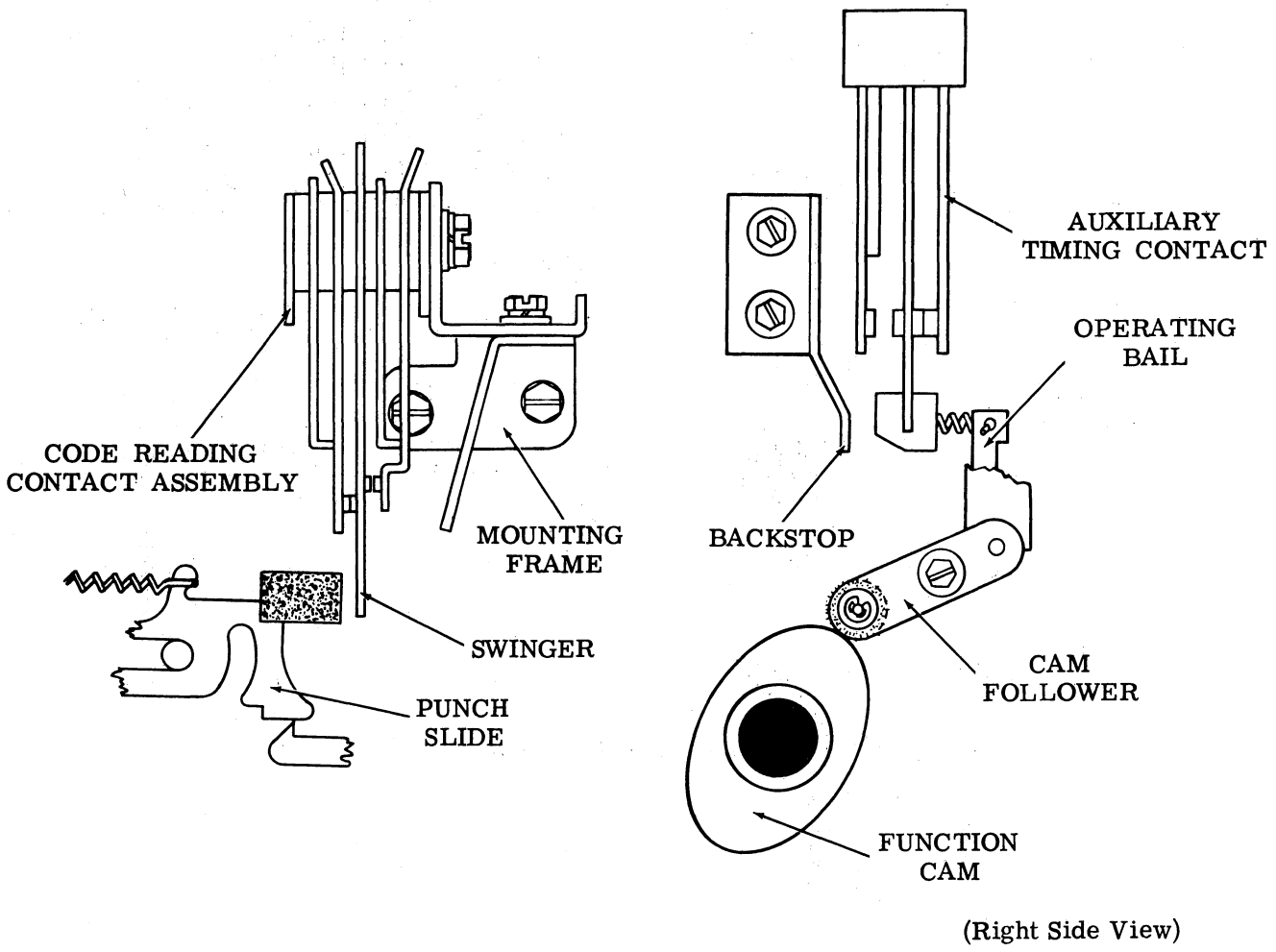


Figure 14 - Code Reading and Auxiliary Timing Contacts