IBM
TRADE MARK

CUSTOMER ENGINEERING REFERENCE MANUAL

PREVENTIVE MAINTENANCE & ADJUSTMENTS

552

Alphabetical Interpreter

MACHINE NUMBER

552- 20156-B Y

INTERNATIONAL BUSINESS MACHINES CORPORATION
590 MADISON AVENUE, NEW YORK 22, NEW YORK

552-20156

DIAGRAM LISTING

DIAGRAM NUMBER	DESCRIPTION
Wiring Diagram 161561 7	Machine Wiring Diagram & Timing Chart

IMPORTANT: Customer Engineering Memorandums 324A through 2120 that apply to this machine are included in this manual.

Printed in U.S.A.

Form 22-8444-3

CONTENTS

ALPHABETICAL INTERPRETER

Type 552

Current Requirements

	60 cy.	50 cy.	25 cy.	DC
115 volts 1 phase	8.0 amp.	9.6 amp.	7.3 amp.	
115 volts 3 phase	5.0	6.0		
208 volts 1 phase	4.4	5.3		
208 volts 3 phase	2.8	3.3		
230 volts 1 phase	4.0	4.8	3.6	
230 volts 3 phase	2.3	3.0		
115 volts DC				4.8
230 volts DC				2.6

Weight

Packed—app. 856 pounds
Unpacked—770 pounds

Dimensions

Length—34 inches
Width—20 inches
Height—51 inches

General

The Alphabetical Interpreter, Type 552, is used to print the alphabetical and numerical codes punched in an IBM card on the face of the card. It interprets 60 cards per minute, and is furnished for 80-column cards only.

The machine contains a motor-generator set or a metallic rectifier power supply which supplies 46 volts DC for the control circuits.

DRIVE

LUBRICATION

IBM 9

1. Reverse friction lock, especially at the point where the steel shoulder of the drive pulley operates against the reverse friction lock arm.
2. Bijur lubricator.
3. Motor and motor-generator.

IBM 17

1. Light film on all linen delecto gears and cams.
2. All gears and cam surfaces not lubricated by Bijur System.

IBM 21

1. Zerk fitting in drive pulley.

Adjustments

Drive Belt

The belt consisting of about 85 links should be installed with the small ends of the links leading in the direction of rotation. Open the belt, place it around the drive pulley, and bring the ends up around the driven pulley. The ends should lack three to four inches of meeting. Add or remove links to obtain this condition. This should provide the correct belt tension. Check the tension by operating the machine under power. The tight side of the belt should be a straight line from pulley to pulley, but the slack side should be slightly bowed.

Dynamic Braking

After the machine has warmed up, adjust the 25-ohm variable resistor to cause the machine to stop between 260° to 285°.

CARD FEED

Preventive Maintenance

The feed knives are adjusted for vertical printing registration, not for brush timing. The brush timing is obtained by shifting the brush holder.

The hopper side plates are adjusted for lateral printing registration. Brush tracking is corrected by shimming the brush assembly holding brackets.

Clean the contact roll drum with trimite paper or crocus cloth.

LUBRICATION

IBM 6

1. Roller throat
2. Card lever pivot points

IBM 9

1. Feed knife guide slides
2. Feed knife guide pin
3. Brush separator roll bearings
4. Card stacker shaft assembly pivots
5. Bell crank assembly pivot
6. Ribbon shield operating arms
7. Gripper finger pivots
8. Gripper finger felt wipers.

IBM 17

1. Card levers. Very light film between operating lever and phenolic pad on contact strap.
2. Both ends of bell crank assembly.

Adjustments

Magazine Side Plates and Posts

Lateral Printing Adjustment. The printing adjustment is obtained by delivering the card to the printing position in the proper registration. Position the hopper side plates by means of the adjustable bushings so the card is aligned to the print bars to cause printing as shown in Figure 1. There should be a .005"-.008" clearance over the length of the cards.

Position the hopper posts by adding or removing shims to obtain a .005"-.008" clearance over the width of the cards.

Feed Knives

1. Adjust the feed knives for .004" to .0045" projection above the knife block.

2. At the extreme rear position the feed knives should travel .020"-.040" beyond the 9 edge of the card. This clearance is obtained by loosening the setscrew and adjusting the knife block adjusting screw.

3. Turn the machine to 32°. Insert a card in the magazine and move it against the first feed rolls. The card should just touch the knife edges. This shows that the feed knives are feeding the card evenly to the first feed rolls. If this timing is incorrect, the vertical printing registration should be checked before proceeding.

4. *Vertical Printing Adjustment.* Loosen the setscrews which hold the card-feed crank to the shaft and shift the knives to deliver the card to the printing position at the proper time. This should result in causing the printing to be centered on a line 1/8" from the leading edge of the card (Figure 1). If the condition of step 3 is met and the printing is off registration, check the contact drum brake.

NOTE: When the feed knife adjustment is changed, the brushes must be retimed.

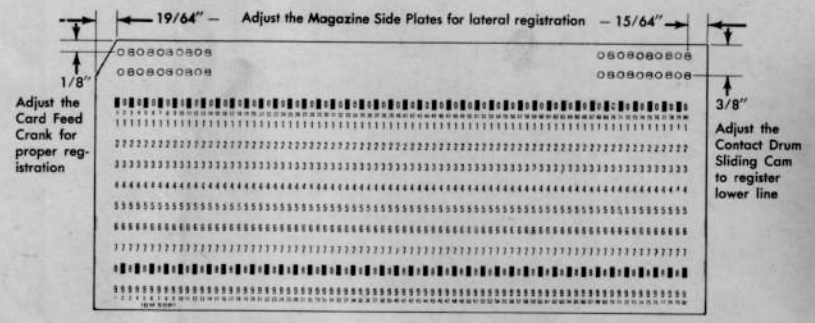

Figure 1. Printing Registration

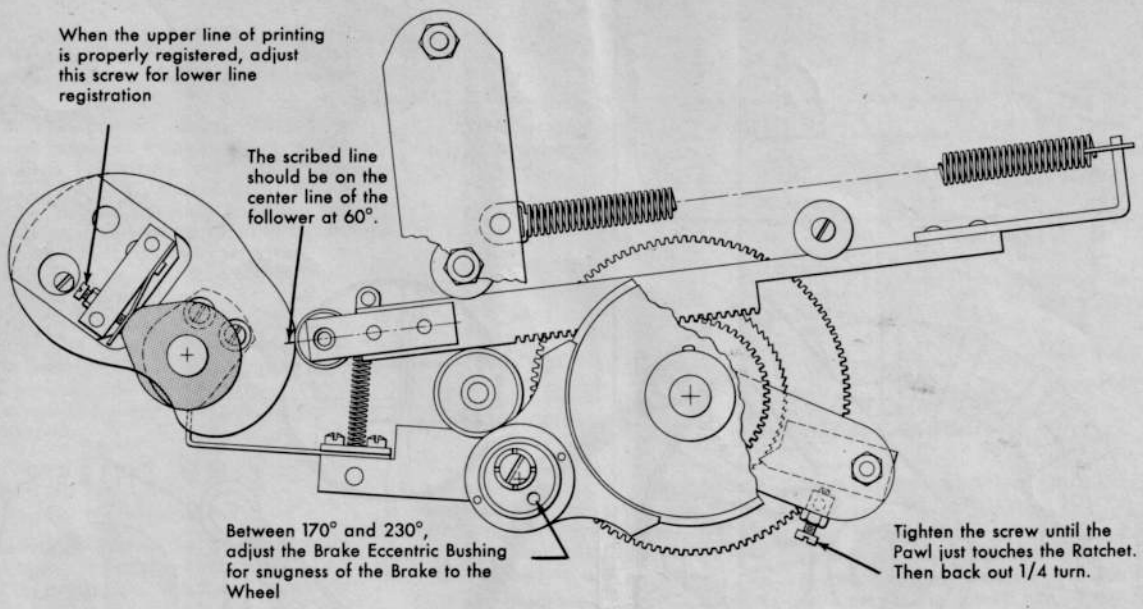

Figure 2. Contact Drum Cam and Ratchet Pawl

Contact Drum Ratchet Pawl (Figure 2)

When released and moved in a counterclockwise direction, the pawl should clear the ratchet gear by .003" to .008". This adjustment can be obtained by tightening the screw until the pawl just touches the ratchet and then backing the screw out ¼ turn. Check the entire circumference of the ratchet for clearance between it and the pawl.

Make your check operations (upper and lower line printing) for a ⅓ to ⅔ tooth overlap of the ratchet pawl and the ratchet gear when the ratchet pawl is in its restored position. See CEM 1190. A very small change in the vertical printing adjustment can be made to obtain this condition.

Contact Drum Brake (Figure 2)

Turn the machine to a point between 170° and 230°. Adjust the brake eccentric bushing for snugness of the brake to the wheel. It must engage the brake disc firmly enough to prevent overthrow of the contact drum, but must not twist the contact drum shaft.

Throat Knife and Roller Throat

1. Loosen the throat block clamping screw and position the throat block so that the scribed line is directly beneath the edge of the throat knife facing the magazine. Tighten the clamping screw.

2. Loosen the two screws holding the throat knife. Use the .0095" feeler gage to set the throat clearance. Tighten the screws.

Card Guides

The card guides are attached to the magazine back plate and should be adjusted for a clearance of .012"-.018" to the lower guide plate.

Card Lever Contact

This contact is located underneath the feed magazine. Adjust the contact for 1/16" air gap when open. When operated, the fixed strap should rise 1/32" off its support. Adjust by forming.

Brush Assembly

1. The reading brushes are adjusted for ⅛" projection beyond the separator. When the standard brush adjusting gage (IBM 450388) is used, the heel of each brush should be even with the line nearest the bend in the gage.

2. Correct tracking through the center of the punched holes in the card is obtained by shimming the brush assembly holding brackets located on the side castings. The tracking should be checked whenever the magazine side plates are adjusted.

3. The brushes are timed by loosening the brush holder clamping screws and moving the brush holder within the assembly. The brushes should make through a hole at least 1½° before the corresponding selecting impulse and break no earlier than 1½° after the end of the impulse. Check the timing at both ends of the card.

CAUTION: The card is moving fast at this time.

When the brushes are worn to the extent that the duration of contact through the hole is increased, difficulty may be experienced. A worn brush, making contact before CB5 and 6 have broken the circuit for the previous impulse, may result in energizing the magnets early. This causes printing under. With a worn brush making contact too long, it is possible for a zero hole to make contact for a one impulse, and the type bar will be stopped for a zero-one position which is normally blank. To overcome these conditions the timing of the main CBs should be very accurately performed.

Occasionally a brush will drop into a zero hole in the card while CB2, due to its long duration, is closed for an X. If the brush overlaps the CB by as little as 1° the charging of the 2 mfd. capacitor may operate the print magnet. Such an impulse will start the type bar moving too soon, and it may be deposited on the X bail. To overcome this condition, zone cams CB2 and 3 are now cut for a shorter duration. The shorter duration cams are part 160759.

Contact Drum Cam (Figure 2)

For timing purposes, the scribed line on the cam should be on the center line of the cam follower at 60°.

The vertical printing registration of the lower line is obtained by adjusting the screw on the sliding cam assembly. This adjustment should be made after the upper line has been registered by adjusting the feed knife timing.

Lower Ribbon Shield (Figure 3)

The lower ribbon shield should be adjusted so that its upper edge is 6 17/64" below the top of the side frame. There should be a clearance of .012"-.014" between the shield and the contact drum. Adjust the mounting bracket to obtain these conditions.

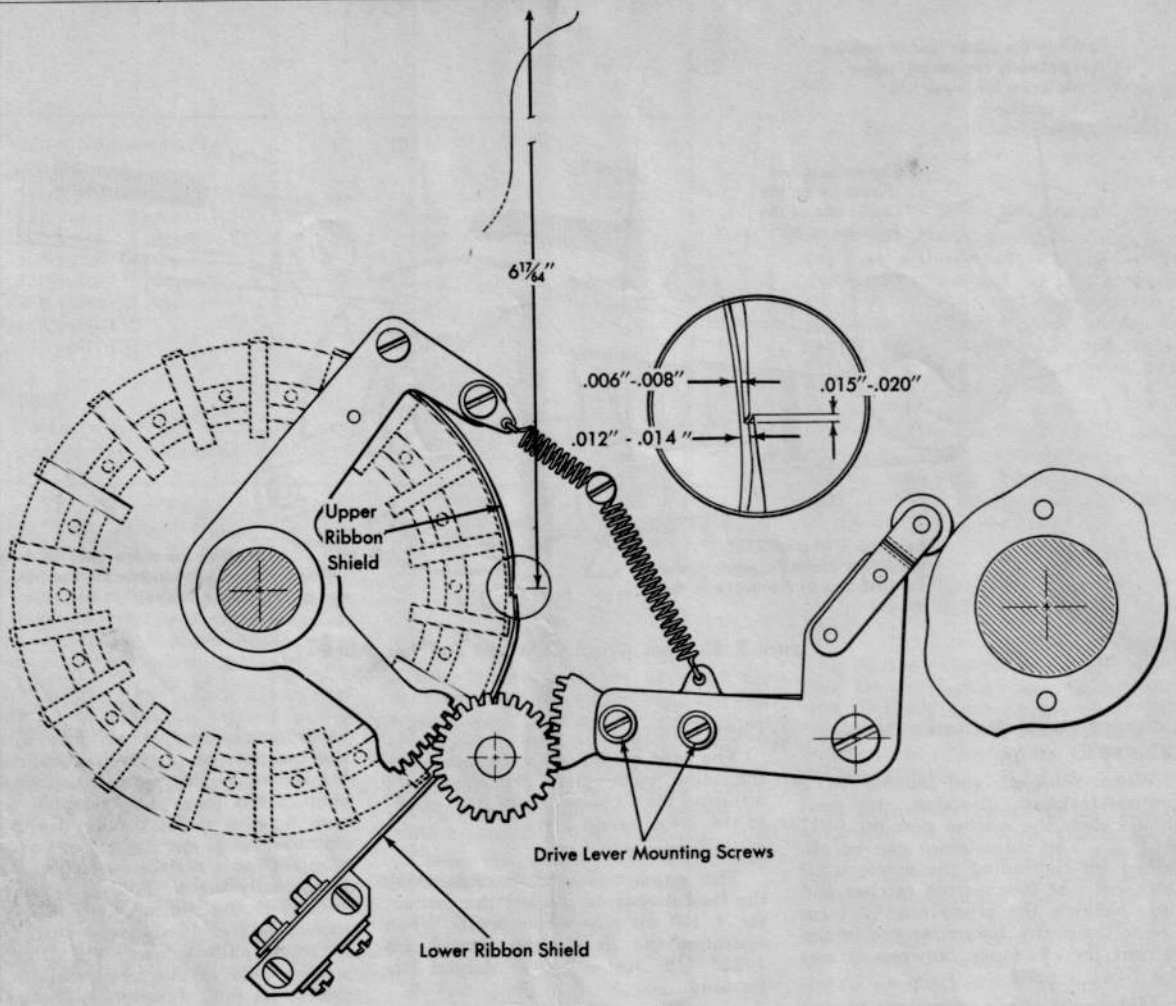

Figure 3. Ribbon Shields

UPPER RIBBON SHIELD (FIGURE 3)

The upper ribbon shield should have a clearance of .006"-.008" to the contact drum. This is obtained by adjusting the upper ribbon shield mounting screws.

Turn the machine to 100°. The upper shield should be overlapped by the lower shield by .015"-.020", and a clearance should be maintained between them. The drive lever mounting screws control this adjustment. At 210°, the opening between the shields should be 3/16" to 7/32".

STACKER CONTACT

In the normal position, the operating strap should raise the fixed strap 1/64" off its support. The contact should be positioned to open when approximately 900 cards are in the stacker.

JAM CONTACT

The jam contact operating arm should just touch the operated strap with no cards in the machine. Position the jam contact lever in the feed to obtain this adjustment. Open points should have an air gap of .020"-.025" normal or operated. Closed points should have .015" rise of the fixed strap from its support. These adjustments may be attained by positioning the mounting bracket and forming the contact support straps.

With no cards in the machine, there should be about .040" between the jam contact operating arm and the adjustable backstop screw. This clearance should allow the contact to be operated fully but prevent the contacts from being moved to the point where they lap. This causes a possible latching action and stopping the machine.

Removals

CONTACT DRUM GRIPPER FINGERS

Individual gripper fingers of the contact drum can be removed by turning the machine until the finger is opposite the elongated hole in the side frame. By removing the adjacent screws, the finger can be removed.

CONTACT DRUM

1. Remove the print unit.
2. Remove the ribbon from the upper ribbon spool. Remove the upper ribbon spool by loosening the screw which holds the rear end and sliding it out through the front side frame.
3. Remove the ribbon tensioner by loosening its pivot screws. Remove the posts which hold the other ends of the springs.
4. Remove the upper ribbon reversing shaft by driving the two pins which hold the pawls and sliding the shaft out through the front frame.
5. Remove the upper ribbon guide rod by unscrewing it and removing it through the front frame.
6. Remove the upper ribbon shield by removing four screws from the sectors.
7. Remove the two upper locating studs which position the print unit.
8. Remove the card guide plate.
9. Remove the ribbon feed operating arm and the ribbon feed pawl bar assembly.
10. Remove the screw and retainer from the front of the contact drum shaft.
11. Remove the brake shoe assembly.

12. Drive the pin holding the contact drum ratchet. (This has the same taper as the pin holding the brake disc.)

13. The contact drum shaft may now be removed from the rear of the machine. The drum cam guide bar tool, IBM 450367, should be used as a follower to hold the shaft keys and the card gripper opener cams in position. When the shaft has been removed, the contact drum can be lifted out through the top of the machine.

14. To replace, reverse the procedure. Use care when replacing the shaft because the bakelite drum ends can be cracked if the shaft is forced in when the keys are not properly positioned.

PRINT UNIT

Preventive Maintenance

Before removing the type unit from the machine, remove the link belt and operate the machine manually under power without cards and observe the movement of the type bars. Check the releasing time and the restoring of the bars. There will be a tendency for any bar in which the friction slide spring tension is insufficient to fall down during the restoring portion of the cycle. Note the position of any bars not operating correctly and remedy when the unit is removed.

With the unit removed, inspect

a. Type bars for bent or broken type tails, broken return springs, and freedom of operation of type bars in their guides.

b. Printing pressure bar assembly for wear.

Dirt and dried ink should be removed from the print unit by rinsing the unit in cleaning fluid. Plastic type cleaner, part 450528, may be used as an alternate method to clean type faces.

LUBRICATION

IBM 6

1. Selection pawls and zone pawls
2. Type bar stop pawls

IBM 9

1. Ribbon feeding mechanism
2. Zoning bail pivot points

IBM 17

1. Internal cuts in zoning pawl restoring lever cams.
2. Zone carrier lever arms at ends that fit into type unit.
3. Type bar friction springs.

IBM 20

1. Cam rollers for zoning carrier lever, zoning bail cam roller and pin bail cam roller.

Adjustments

PRINTING CAM SHAFT (FIGURE 4)

Because the index is pinned to the printing cam shaft at the factory, it should be made the starting point for all machine timings. If the machine is disassembled, the print cam shaft should be retimed first. After this shaft is correctly timed, the remaining shafts may be retimed in any sequence.

Turn the machine by hand until the printing cam follower just starts to ride on the high lobe of the cam. Insert a .005" feeler gage between the follower and the cam. Continue to turn the machine until the feeler gage assumes an absolutely vertical position. Check this position by measuring from the feeler gage to the print unit. At this point set the index to 210°. The cams are held on the shaft by setscrews to permit adjustment.

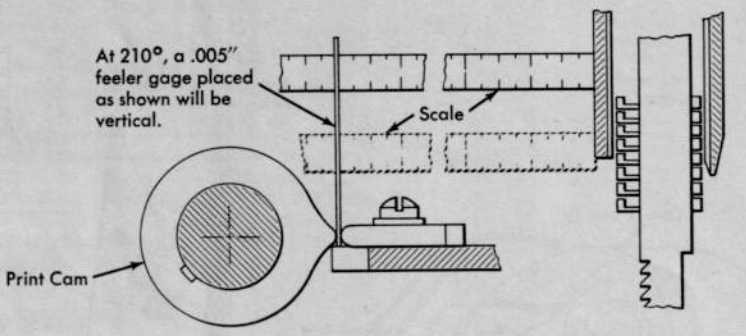

Figure 4. Timing the Printing Cam Shaft

CAM SHAFT ASSEMBLY (FIGURE 5)

A timing gage, IBM 450428, is available as an office tool to facilitate retiming the main cam shaft if its timing is lost. The tool consists of a small bar with two studs. When one of the studs is placed in the locating hole in the restoring bail cam, and the other stud is placed in the magnet unit locating pin hole, the tool locates the main cam shaft in position at 108° of the index.

If the timing gage is not available, the main cam shaft may be timed by the following method:

1. Remove the top of the print unit.
2. Turn the machine index to 341°.

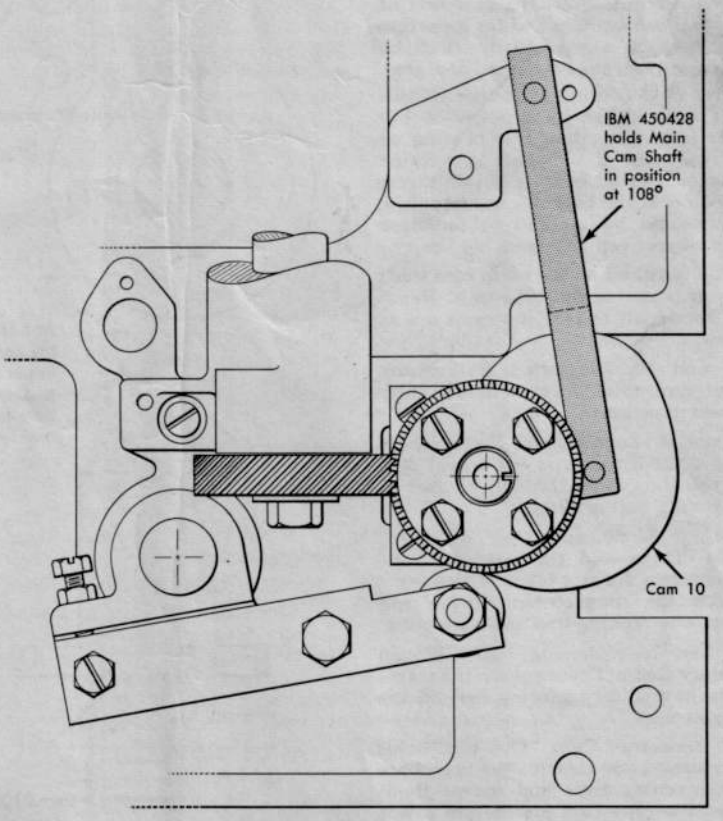

Figure 5. Timing the Main Cam Shaft

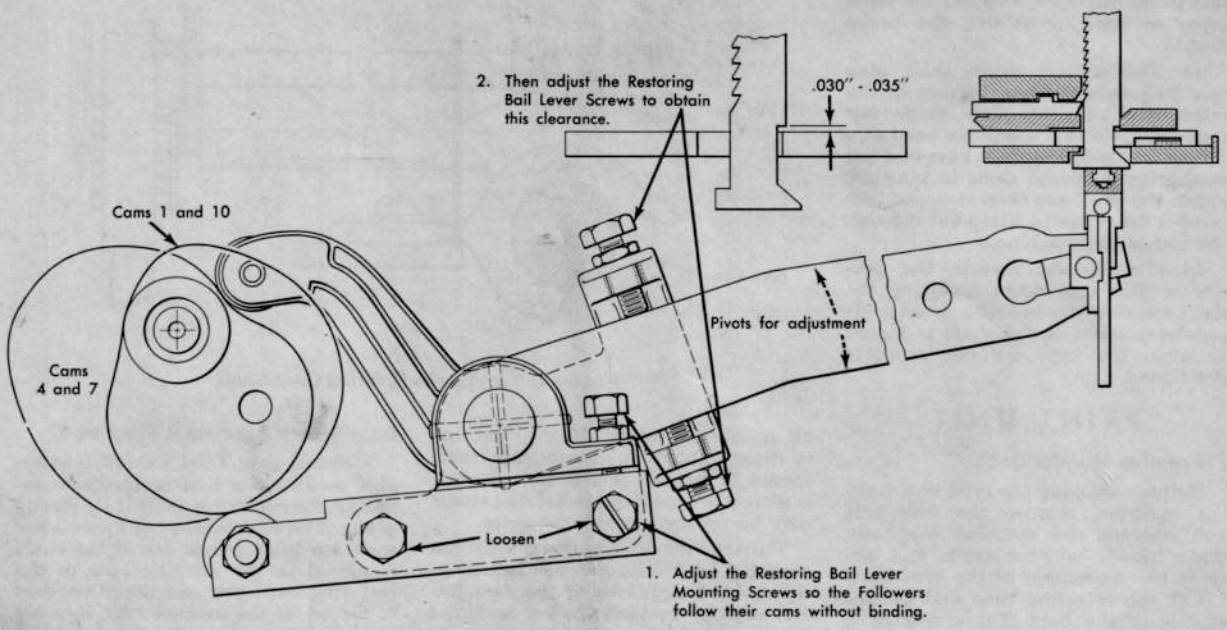

Figure 6. Zone Pawl Latching Clearance

3. With the type bar restoring cam followers on the high dwells of the cams, the type bars should be .010" below the print unit side frames.

The drive gear on the rear end of the shaft can be adjusted for a portion of a tooth in relation to the shaft by means of the four screws on the gear.

The ball bearing housings of this shaft are similar in appearance but differ in construction. The bearing on the front end of the shaft is a thrust bearing; the rear bearing has no thrust provision. If the bearings are removed, they should be marked to facilitate their correct replacement.

The ten cams on the main cam shaft furnish power to the type unit. Reading from front to rear the cams are as follows:

1 and 10. *Restoring Bail Cams.* These cams raise the type bars to their highest position.

2 and 9. *Zone Carrier Cams.* These cams control the type bar travel during selection time through control of the zoning bail carriage.

3 and 8. *Magnet Unit Restoring Cams.* These and the adjacent zone carrier cams are one piece. These cams relatch the magnet unit drive rod levers after zoning and after selecting.

4 and 7. *Restoring Bail Complementary Cams.* These govern the travel of the print unit restoring bail on the down stroke.

5. *Zone Bail Cam.* This cam holds the zoning bails clear of the type bars during zoning time and moves them under the type bars just before select time.

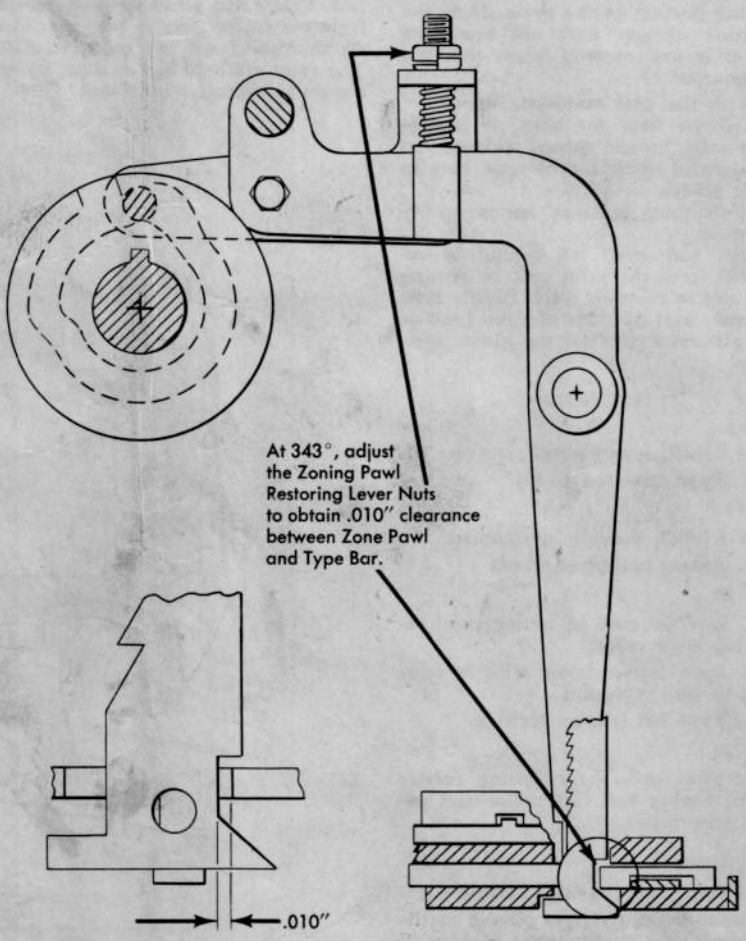

Figure 7. Zone Pawl Clearance

6. *Pin Bail Operating Cam.* This operates the pin bail, placing the drive rods in either the zoning or selecting position.

Restoring Bail Cam Followers (Figure 6)

The restoring bail lever mounting screws should be adjusted so that the restoring bail arms are at all times under the control of the restoring bail cams (1 and 10) or the restoring bail complementary cams (4 and 7). The cam followers should follow their respective cams without binding.

Zone Pawl Latching Clearance (Figure 6)

The purpose of this adjustment is to insure that the type bars rise high enough when restored to provide a .030" to .035" clearance for the zone pawls to latch.

1. Remove the top plate from the type bar housing.

2. Turn the machine to the point where the type bars are at their highest point of travel. Press the type bars down against the restoring bail. Measure the distance from the top of the side plates to the type bars.

3. Turn the machine until the type bars come to rest on the zone pawls. They should have moved downward .030"-.035" from their former position. Check at both ends of the unit.

4. Adjust the restoring bail lever adjusting screws to attain this clearance.

Zone Pawl Clearance (Figure 7)

With the machine set at 343°, a .010" clearance should exist between the zone pawls and the type bars. This clearance, which prevents the zone pawls from binding the type bars, can be observed by looking through the hole in the side of the type unit. To obtain this clearance, back off the zoning pawl restoring lever nuts until the zone pawl is against the type bar. Then turn the nut clockwise one revolution to obtain the .010" clearance. Crank the machine to the point where all the zone pawls are released (84°). All the bars should move downward at the same time.

Zoning Bail Link (Figure 8)

Turn the machine to the point where the type bars just start to rise. Adjust the zoning bail link (turnbuckle adjustment on the cam 5 follower) for 1/16" overlap of the toe of the type bar on the zone bail.

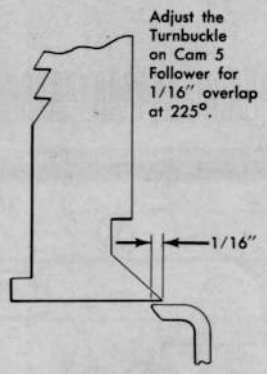

Figure 8. Zoning Bail Link Adjustment

Zero Printing Alignment (Figure 9)

With the type bars resting on the zero zone bail and the index at 204°, adjust the zone unit locating bar screws so the zero type bar tooth is in line with the selecting pawl. This adjustment results in the proper zero printing alignment. A card punched with zero and 8's in alternate columns should be run through the feed to check the alignment.

List Lap Adjustment (Figure 9)

Turn the machine to 115½° (2 select time). Push in the end select pawls. The pawls should overlap the first tooth on their respective bars by 1/64". Adjust the zoning carrier lever eccentric to obtain this condition.

Printing Registration

The lateral printing registration is obtained by adjusting the magazine side plates as described in the card feed adjustment section.

The vertical printing registration is obtained by adjusting the timing of the feed knives, as described under *Card Feed Adjustments.*

The vertical printing registration of the lower line is obtained by adjusting the screw on the contact drum sliding cam assembly. This adjustment should be made after the upper line has been registered, because any change of feed knife timing will alter both adjustments.

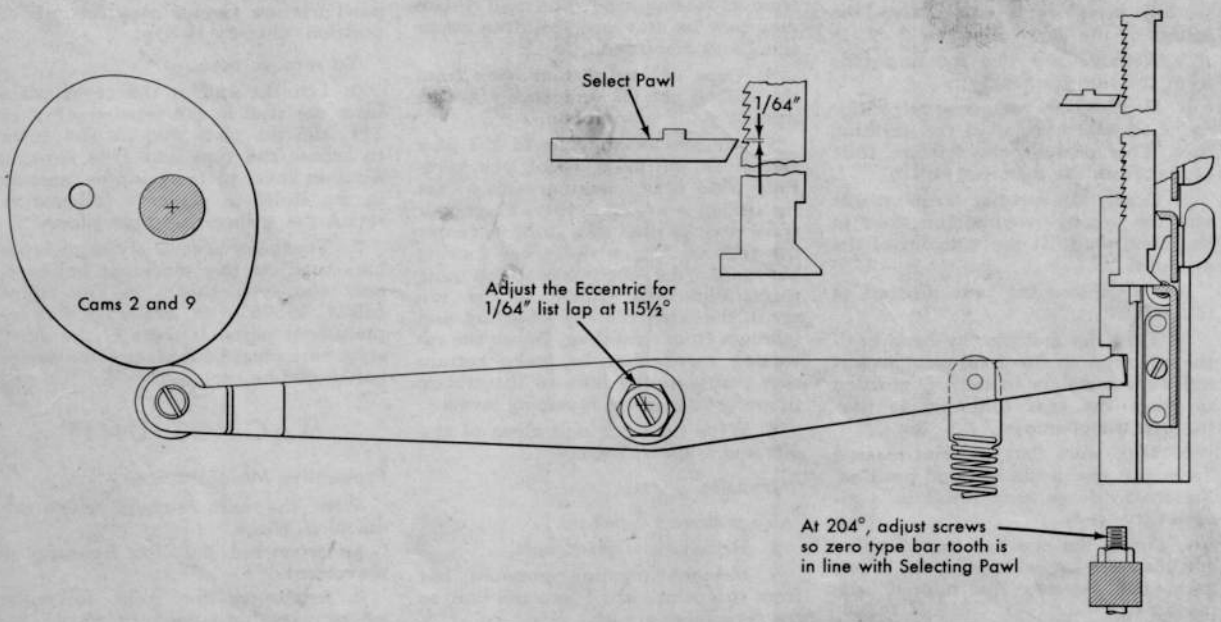

Figure 9. Zero Printing Alignment and List Lap Adjustment

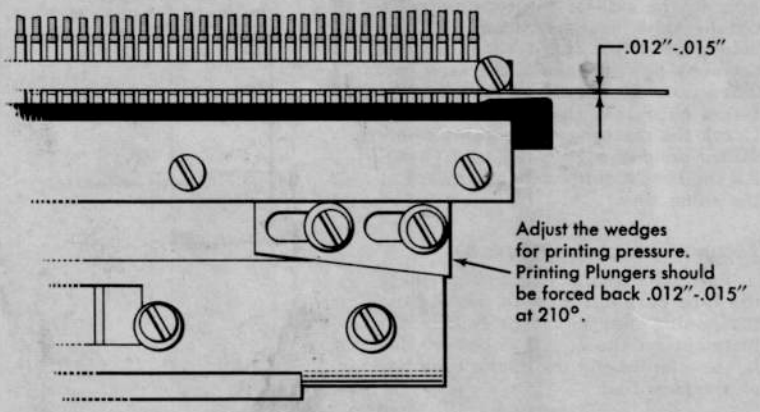

Figure 10. Printing Pressure Bar

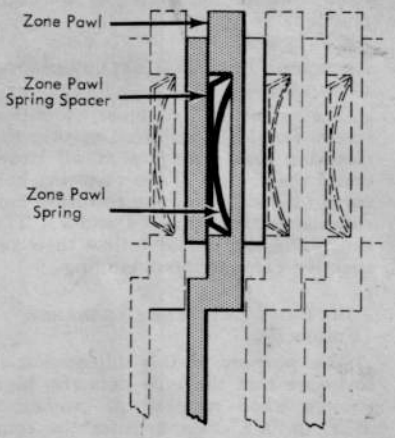

Figure 10A. Zone Pawl Springs

PRINTING PRESSURE BAR (FIGURE 10)

Manually trip off all the armatures and turn the machine to 210°. There should be a .012"-.015" clearance between the printing plunger tails and the locating comb. Loosen the eight clamping screws and adjust the wedges to obtain this adjustment. Check the clearance at both ends of the comb.

Removals

PRINT UNIT

1. Raise the brushes.

2. Turn the machine by hand until the openings in the zoning pawl restoring lever cams are above the rollers of the cam followers.

3. Remove the two locating pins from the side frames.

4. Remove the restoring bail hinge rod from the bottom of the printing unit. This releases the friction slide carrier from the restoring bail.

5. Grasp the typebar frame spacer and the zoning pawl locking rod in one hand, and lift the unit out of the machine.

6. To replace the unit proceed as follows:

a. Turn the machine by hand until the openings in the zone pawl restoring lever cams are in the UP position to allow the cam followers to pass through the openings.

b. Make sure that all print magnet drive rods are in the restored position. Failure to do so may result in damaged drive rods.

c. Grasp the typebar frame spacer and the zoning pawl locking rod in one hand and replace the unit in the machine.

d. Replace the locating pins in the side frames.

e. Replace the restoring bail hinge rod. Make certain that the hinge rod is centrally located and clears the side frames.

RIBBON

To change the ribbon,

1. Remove the print unit.

2. Trip the ribbon feed mechanism and wind the ribbon on the upper spool.

3. The ends of the ribbon are equipped with locking bars that fit in the splines in the spools and are held by ribbon retainer rings. Depress the bar on the lower spool near one end, and the other end can be removed from its retainer ring. The used ribbon may now be unwound from the upper spool and discarded.

4. Wipe off any dirt and ink from the ribbon shields and spools before installing the new ribbon.

5. Fit the locking bar of the new ribbon on the lower spool, and carefully wind it on, making certain that the ribbon is wound evenly. The upper spool may be used as a guide to center the ribbon. Attach the other locking bar under the upper spool retaining rings. Wind the ribbon to the top spool, checking for even feeding and freedom from wrinkling. Check the reversing mechanism to make certain that the reversing bars in the ribbon properly engage the reversing levers.

6. Wipe the print unit clean of any dirt and ink, and replace.

TYPEBARS

To remove a typebar,

1. Remove the print unit.

2. Remove printing pressure bar from the print unit. Place the unit so the type faces are up.

3. Release the typebar from the restoring bail by removing the locking pin from the friction slide bar and sliding the bar to the proper typebar.

4. Remove the four screws that pass through the side frames and hold the guide comb. Remove the comb.

5. Remove the four screws that hold the zoning pawl retainer plate. Remove the plate.

6. Spread the zone pawls, and the typebar may be drawn through and released from the unit.

7. To re-assemble, reverse the procedure. Mesh the comb with the typebars first, and the replacement will be easier.

CAUTION: Use care to avoid raising the zoning pawls because the zoning pawl friction springs may fall out of position (Figure 10A).

To remove type,

1. Lift the end of the cover plate from the stud in the typebar (Figure 11), and the plate may be slid down to expose the type and type springs. Another cover plate should be inserted in the slides to act as a follower to retain the springs and type pieces.

2. There are several styles of typebars used on this machine; however, only the type shown in the figure (IBM 155061) is available for replacement parts. If parts of the older style bars must be replaced, the entire bar should be replaced.

MAGNET UNIT

Preventive Maintenance

With the unit removed from the machine, check

a. Drive rod bail for freedom of movement.

b. Armatures for wear at point where drive rod lever contacts it.

c. Terminal wires for loose or broken connections.

d. Ribbon feed assembly for wear and freedom of operation.

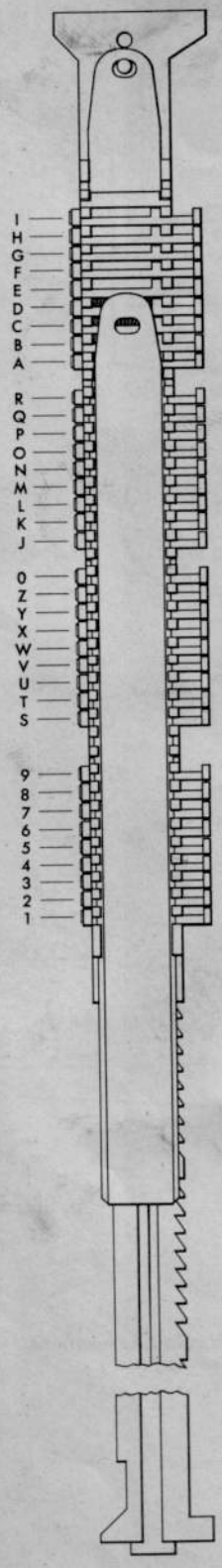

Figure 11. Type Bar

LUBRICATION

IBM 6

1. Print magnet armature pivot points.

IBM 9

1. Operating slides for restoring bars.
2. Restoring bail cam follower pivots.

IBM 17

1. Magnet armatures at point where drive rod levers rest.
2. Top of magnet unit restoring levers where they fit into the slots in the sides of the magnet unit.

IBM 21

1. Cam rollers for magnet restoring cams.

Adjustments

The following adjustments are best performed with the magnet unit removed from the machine.

ARMATURE STOP

With the armature in its de-energized position, adjust the armature stop so the inside edge of the armature is in line with the drive rod lever. The armature stop is adjusted to the two end armatures, and the remaining armatures, if not in correct adjustment, must be formed individually to meet this condition.

ARMATURE

1. The clearance between the lower magnet core and the armature should be .015", when the armature is latched on its drive rod lever. When an adjacent armature is removed, this clearance may be easily checked. Adjust by forming the armature (Figure 12).

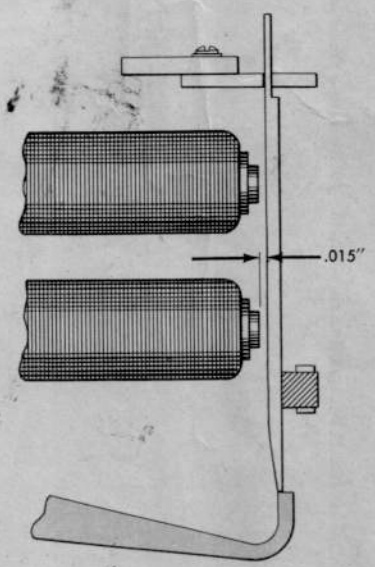

Figure 12. Armature-to-Core Clearance (De-energized)

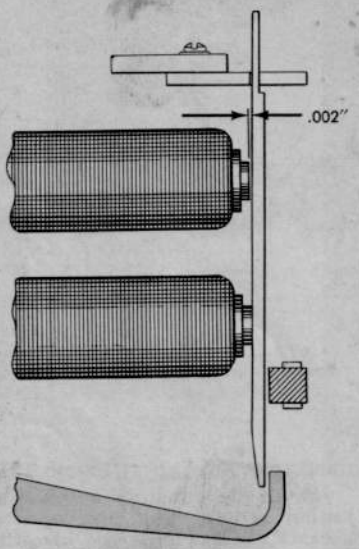

Figure 13. Armature-to-Core Clearance (Energized)

2. A .002" clearance should exist between the armature and the upper core when the armature is held against the lower core. (Figure 13).

3. With a .003" feeler gage between the lower core and the armature, the drive rod lever should trip off the end of the armature when the armature is attracted. (Figure 14).

4. With a .005" feeler gage between the lower core and the armature, the drive rod lever should remain latched on the tip of the armature.

Be sure to check for freedom of movement after obtaining adjustments by forming.

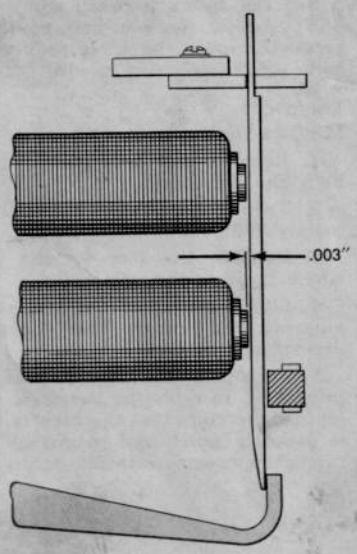

Figure 14. Unlatching Clearance

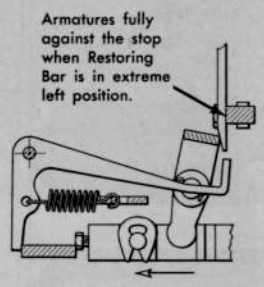

Figure 15. Armature Knockoff Adjustment

ARMATURE KNOCKOFF (FIGURE 15)

Adjust the armature knockoff adjusting screws until the armature knockoff bail returns the armatures fully against the armature stop when the restoring bar is in its extreme left position. CAUTION: Too tight an adjustment may result in the armature knockoff bail bending the armatures.

The following adjustments are made with the unit in the machine.

RESTORER LEVER LINKS (FIGURE 16)

Adjust the restorer lever link screws for a 3/64" clearance between the armatures and the drive rod levers when the levers are in the maximum retoring position (90-93°).

DRIVE ROD CLEARANCE (FIGURE 17)

Check for .015" to .030" clearance between the ends of the drive rods and the zoning and selecting pawls. If the clearance is not sufficient, remove the unit and lightly stone the ends of the rods.

PIN BAIL (FIGURE 17)

Set the index between 108° and 168°. Adjust the pin bail adjusting screw to center the drive rods vertically on the selecting pawls.

Removal

MAGNET UNIT

1. Remove the belt guard, drive belt, and drive pulley.

2. Turn the machine to approximately 290°.

3. Remove the four locking pins which position the unit.

4. Slide the magnet unit to the left, allowing the restorer lever links to disengage.

5. To replace the unit, reverse the procedure. In replacing the drive pulley make certain that the reverse lock is properly positioned to engage the ratchet if reverse rotation occurs.

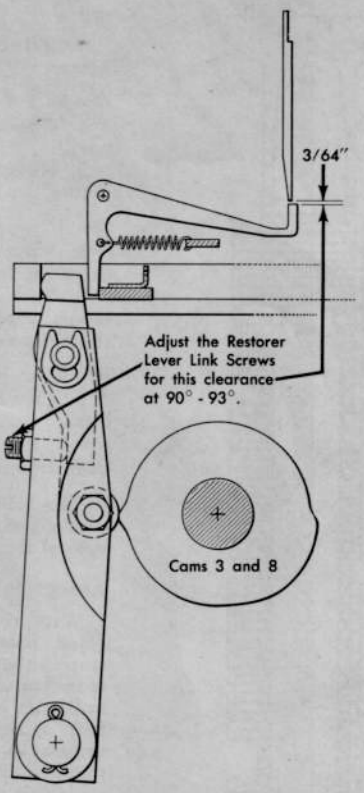

Figure 16. Restorer Lever Links

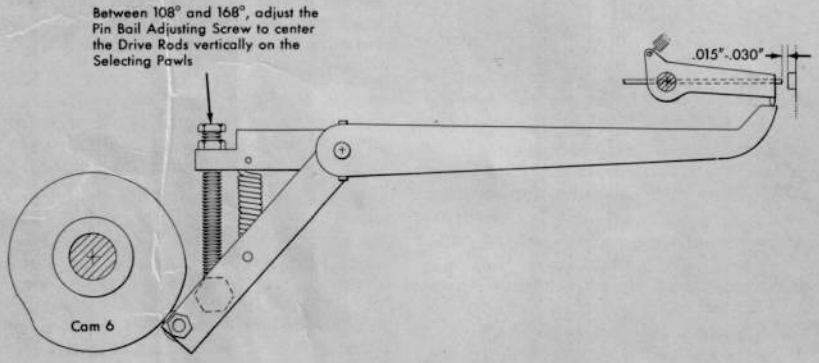

Figure 17. Drive Rod Clearance and Pin Bail Adjustment

CUSTOMER ENGINEERING MEMORANDUMS

324A *CB's, 2, 3, 4, 5, & 6
405A Feed Rolls and Gears
445 Hardened Bushings for Type Bar Unit Locking Pin
472 *Ribbon Shields
497 *Jam Contact
523 Belt Drive Stacker
543 Electrolytic Condenser
554 *Jam Contact
635 Zone Pawl Restoring Bar
653 Motors
727 Hand Crank
732 Stationary Control Panel
739A Belt Guard
744 Card Feed Hopper
767 *Drive Belt Tension
871 *Type Bar
929 Start and Stop Keys
958 *Type Bar Spring 156922
968 *Timing the Main Cam Shaft
1028 Casters
1065 *Contact Drum Sliding Cam Assembly
1101 *Type Bar Tool
1154 Printing Plunger Pad
1162 Blueprint Envelope
1173 Ribbon Spool Front Bearing
1186 Feed Adjustments, .009 Card Stock
1190 Printing High
1261 *Brush Adjusting Glass, Part 450388
1443 Type Bar Rubber Bumper
1573 Print Unit Locating Stud (upper)
1798 Control Panel Wire Guard
1982 Service Hints
1996 *Dynamic Braking — Adjustable Resistor
2002 Dynamic Braking — Duo Relay Control
2009 Power Supply Capacitors
2120 Circuit Breaker Guard

*The text incorporates these memos.

NOTES

NOTES

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