IBM CUSTOMER ENGINEERING

REFERENCE MANUAL

PREVENTIVE MAINTENANCE

Sorter Type 80

CONTENTS

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PREVENTIVE MAINTENANCE

Sorter, Type 80

DRIVE AND CARD FEED MECHANISM

I. Cleaning

Brush out thoroughly all accumulated card dust and dirt from card magazine and feed area into waste basket or suitable container, never on the floor. Clean all dirt and old grease from worm gears, drive shaft, and oil holes of feed roll bearings.

II. Inspection

1. Feed. (*see General Section—Horizontal Feeds*)
   - (a) CLEANING
   - (b) FEED KNIFE ADJUSTMENTS
   - (c) FEED KNIFE GUIDE SLIDES
   - (d) CRANK SHAFT AND CONNECTING LINK BUSHING for wear indicated by excessive movement of feed knife slide assembly.
   - (e) EVEN FEEDING OF CARDS
   - (f) HOPPER SIDE PLATES
   - (g) ROLLER THROAT
   - (h) FEED ROLL TENSION particularly on first three sets of gears. Also, check for wear on these.
   - (i) HOPPER POSTS

2. Horizontal Shaft
   - (a) WORM GEARS for wear and lubrication.
   - (b) THRUST BEARING for wear and lubrication.
   - (c) REVERSE LOCK for wear on pawl and spring retaining washer.
   - (d) DRIVE PULLEY for wear and looseness on shaft.

III. Lubrication

IBM 6

(1) Index spindle.

IBM 9

(1) Feed roll bearings, both upper and lower.
(2) Oil cups on horizontal shaft bearing.
(3) Reverse lock mechanism including the spring retaining washer.
(4) Feed knife assemblies.

IBM 17

(1) Large worm gear at hopper end of horizontal shaft.
(2) Feed roll drive worm gears.

IBM 21

(1) Feed knife crank shaft and operating arms bearings.
(2) Thrust bearing on pulley end of horizontal shaft.

SORTING MECHANISM

I. Cleaning

Remove card guide and sort magnet armature and thoroughly clean all dirt and card lint from machine. Be sure and clean all dirt from stop studs on bottom of card guide, but do not use Trimite to clean these. Replace the guide and armature after inspecting them for wear. Be sure and clean dust from between contact roll and common brush bracket.

II. Inspection

1. Sort Magnet Armature for wear and worn residuals while armature is off, and adjustments after re-installing it. Be sure and check for proper return spring tension after checking chute blades.

2. Chute Blades for wear, proper tension and adjustments. A fast way of checking some chute blade adjustments is by use of a gauge made in the following manner:

   Cut an old chute blade into a strip about 9" in length. Finish one end so it is straight and square. About ¼" from the end scribe a line across the chute blade. Mark off eleven more lines ¼" apart from this line. This will make 12 scribed lines. Scribe another line 2 13/16" from the last line. When the gauge is inserted into the chute blades through the throat to this line, it will show the proper position of the #9 chute blade and the following blades as they are ¼" apart. This can be used for positioning of new blades when they are installed. This gauge can be used to check the card guide end adjustment as it is .008" thick.

   Check chute blade tips with chute blade gauge. Gauge should slide under tips and not hit end of blades. This will test chute blade tips for cards passing under the tips.

   Slide gauge through so all chute blades are resting on top of gauge. Attract sort armature. Withdraw gauge and check each blade to see if gauge will slide over each tip and not hit end of chute blade. This will test each chute blade tip for card passing over the end of chute blade. Check clearance between card guide and card guide end with gauge.

3. Commutator
   (a) CLEANING. Remove commutator and clean segments and switch contact spots with Trimite Paper. Replace commutator if badly worn.
   (b) SWITCH CONTACT STRIPS for good tension.
   (c) BRUSHES for wear and timing. If it is necessary to replace a brush be sure to stone the face slightly to remove any sharp edges that would cut and wear commutator.

4. Sorting Brush Holder Assembly for freedom of contact plunger, worn or loose locating pins and centering of brush in hole. Centering of brush can be checked by punching a group of cards in all positions 9 through 12 in columns 1-40-80. As these cards run through the machine with the sorting brush on one of these columns, any variation of the brush from the middle of the punched holes can be easily seen.

5. Sort Brush for wear and timing. When the brush has a positive potential with respect to the contact roll, an insulating film is formed on the face of the brush which either prevents or delays the impulse through the hole in the card, and when it has a negative potential with respect to the contact roll, the chance of building up the insulating film is minimized to a large extent. This can be checked by raising the card brush from the contact roll, turning the machine until the sort commutator is resting on a segment and determining the polarity of the contact roll with a voltmeter. If the negative terminal of the voltmeter is placed against the card brush holder and the positive terminal against the contact roll and the meter deflects in the proper direction, no change is necessary in the machine. If, however, the voltmeter reads backwards, the output leads of the selenium rectifier should be reversed on AC machines. On DC machines, it will either be necessary to provide polarized plugs on the attachment cord or identify the plug and instruct the operator so that the attachment cord will always be plugged in the same way. The wiring to the polarized plug must be such that the brush will be negative with respect to the contact roll when inserted. WHEN POLARITY IS REVERSED, CLEAN ROLL AND REPLACE CARD BRUSH.

6. Sort Magnet Armature Knockoff for timing and wear. The sorting magnet armature knockoff is now adjustable in order that it may be effective at all times, and consists of a threaded stud mounted in the third lower feed roll assembly and held in position by a locking nut. The stud should be adjusted for a clearance of .005" to the sorting magnet armature with the magnet de-energized and the armature held in position at the limit of its upper travel by spring tension.

III. Lubrication

IBM 9

(1) Very slight amount on sort magnet armature pivots.
(2) Spindle pivots bearings and positioning rollers.

IBM 17

(1) Very light film on surface of commutator.
(2) Cotter pin where it hooks the spring and where it comes through the hole in the sort magnet armature.

BASE

I. Cleaning

The entire base of the machine, including legs and braces, should be cleaned with a rag dipped in cleaning fluid.

II. Inspection

1. Stacker Pockets (see *General Section*). Also check card deflectors for wear.
2. Card Levers and Pocket Stop (see *General Section—Card Levers*).
3. Duo Relays (see *General Section*).
4. Slate Base Relays. Particular attention should be paid to the brush relay as this receives the most wear.
   (a) ARMATURE PIVOT SCREWS for wear. If worn out of round, these should be replaced. Remove the relay from the machine to replace and re-adjust the pivot screws properly. Use IBM 6 on these.
   (b) ADJUSTMENTS of .005" between armature and cores when attracted, and .008" between contact points when de-energized.
   (c) RETURN SPRING for good tension.
5. Drive Motor (see *General Section—Motor Generators*). Excessive tension of the "V" Belt on Type 75 and 80 machines reduces the life of the belt and the left hand bearing of the horizontal drive shaft, and also reduces the speed of the machines. Tests have been conducted which have shown that the "V" Belt on this machine should be relatively loose in comparison to the tension applied by most customer engineers. The proper tension may be obtained by adjusting the motor platform so that when the belt is grasped at the top of the base there will be a barely perceptible movement of the motor platform as the distance between the inner faces of the belt at this point is reduced to between 1¾" to 2". Care should be taken to tighten the motor platform adjusting screw properly so that it does not settle and destroy this adjustment. Lubricate the motor with a few drops of IBM 9 lubricant.
6. Bijur System (see *General Section*).
7. Veeder Counters for armature travel and freedom of movement. Lubricate with IBM 6.
8. 75 Vertical Shaft. Clean commutators with rag soaked in cleaning fluid. Check commutators and brushes for wear and timing. Lubricate commutator surfaces with very light film of IBM 17.
9. Contact Roll Cover Switches and Latch. Check for proper operation.

TESTS

RUN A STANDARD test deck, 9's first, then 12's first to check all chute blades and sorting into all pockets. Check especially for any nicking or marking of the cards.

Machines equipped with special devices should have test decks run through to check these units.