TELETYPE

PRINTING TELEGRAPH SYSTEMS

BULLETIN 245B

ADJUSTMENTS AND LUBRICATION

MODEL 28

MULTI-MAGNET REPERFORATOR

LARP , LARB

TELETYPE
CORPORATION
SUBSIDIARY OF
Western Electric Company
CHICAGO, U.S.A.

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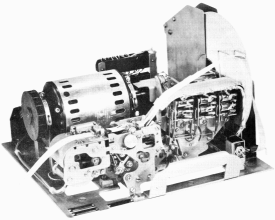


MULTI-MAGNET REPERFORATOR ON BASE

TABLE OF CONTENTS

SECTION 1

SECTION 1

ADJUSTMENTS

1. GENERAL

a. The adjustments of the multi-magnet reperforator are arranged in a sequence that should be followed if a complete readjustment of the unit were undertaken.

b. After an adjustment has been completed, be sure to tighten any nuts or screws that may have been loosened.

c. Tools and spring scales required to perform the adjustments are listed in Teletype Bulletin 1124B but are not supplied as part of the equipment.

d. The adjusting illustrations, in addition to indicating the adjusting tolerances, positions of moving parts, and spring tensions, also show the angle at which the scale should be applied when measuring spring tensions.

e. From time to time the requirements and procedures for the various adjustments may change. For this reason, the text of the adjustment in the latest issue should be read through before proceeding to make any readjustment.

f. If a part that is mounted on shims is removed, the number of shims used at each of its mounting screws should be noted so that the same shim pile-ups can be replaced when the part is remounted.

g. If parts or assemblies are removed to facilitate readjustments and subsequently replaced, recheck any adjustment that may have been affected by the removal of these parts or assemblies.

h. The spring tensions given in this bulletin are indications not exact values and should be checked with proper spring scales in the position indicated. Springs which do not meet the requirement and for which no adjusting procedure is given should be replaced by new springs.

NOTE

When rotating the main shaft of the reperforator by hand, the clutch does not fully DISENGAGE upon reaching its stop positions. In order to relieve the drag on the clutch and permit the main shaft to rotate freely, apply pressure on a lug of the clutch disk with a screw driver to cause it to engage its latch lever and thus DISENGAGE the internal expansion clutch to prevent the clutch shoes from dragging on the clutch drum.

i. References made to "Left" or "Right", "Up" or "Down", "Front" or "Rear", etc. apply to the unit in its normal operating position as viewed from the operator's position in front of the unit opposite the motor and terminal blocks.

j. When the requirement calls for the clutch to be DISENGAGED the clutch shoe lever must be fully latched between its trip lever and latch lever so that the clutch shoes release their tension on the clutch drum. When ENGAGED the clutch shoe lever is unlatched and the clutch shoes are wedged firmly against the clutch drum.

k. All contact points should meet squarely. Smaller contact points should fall wholly within the circumference of its mating larger contact. Contacts having the same diameter should not be out of alignment more than 25 per cent of the contact diameter. Avoid sharp kinks or bends in the contact springs.

(B)

CODE MAGNET ARMATURE STOP BRACKET (PRELIMINARY)

REQUIREMENT

WITH CODE MAGNET DE-ENERGIZED AND CLUTCH DISENGAGED, ARMATURE HELD AGAINST ITS STOP BRACKET CLEARANCE BETWEEN ARMATURE AND UPPER MAGNET CORE

MIN. 0.015 INCH
MAX. 0.020 INCH

TO ADJUST

POSITION THE ARMATURE STOP BRACKET BY MEANS OF ITS ADJUSTING SLOT WITH ITS MOUNTING SCREWS LOOSENED.

PUNCH SLIDE LATCH SPRING

REQUIREMENT

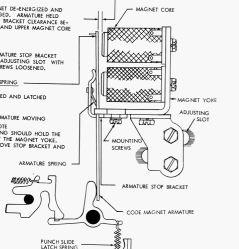
CLUTCH DISENGAGED AND LATCHED

MIN. 2 OZS.
MAX. 2½-2 OZS.

TO START CODE ARMATURE MOVING

NOTE

THE ARMATURE SPRING SHOULD HOLD THE ARMATURE AGAINST THE MAGNET YOKE; IF NECESSARY, REMOVE STOP BRACKET AND BEND SPRING.



(C)

PUNCH UNIT POSITION

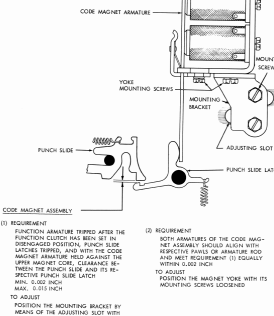
REQUIREMENT

BEFORE MAKING SUBSEQUENT ADJUSTMENTS, POSITION THE PUNCH UNIT AS FOLLOWS: UPPER AND LOWER RIGHT MOUNTING SCREWS CENTRALLY LOCATED IN THEIR ELONGATED SLOTS

TO ADJUST

LOOSEN THE THREE MOUNTING SCREWS IN THE BACK PLATE OF THE UNIT AND THE BRACKET SCREW IN THE FRONT PLATE AND POSITION THE UNIT.

FIGURE 1. CODE MAGNET



(1) REQUIREMENT

FUNCTION ARMATURE TRIPPED AFTER THE FUNCTION CLUTCH HAS BEEN SET IN DISENGAGED POSITION, PUNCH SLIDE LATCHES TRIPPED, AND WITH THE CODE MAGNET ARMATURE HELD AGAINST THE UPPER MAGNET CORE, CLEARANCE BETWEEN THE PUNCH SLIDE AND ITS RESPECTIVE PUNCH SLIDE LATCH

MIN. 0.002 INCH
MAX. 0.015 INCH

TO ADJUST

POSITION THE MOUNTING BRACKET BY MEANS OF THE ADJUSTING SLOT WITH ITS MOUNTING SCREWS LOOSENED.

(2) REQUIREMENT

BOTH ARMATURES OF THE CODE MAGNET ASSEMBLY SHOULD ALIGN WITH RESPECTIVE PAWLS OR ARMATURE ROD AND MEET REQUIREMENT (1) EQUALLY WITHIN 0.002 INCH

TO ADJUST

POSITION THE MAGNET YOKE WITH ITS MOUNTING SCREWS LOOSENED

FIGURE 2. CODE MAGNET

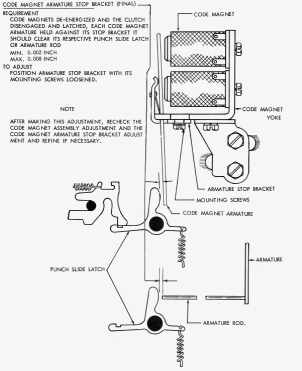


FIGURE 3. CODE MAGNET

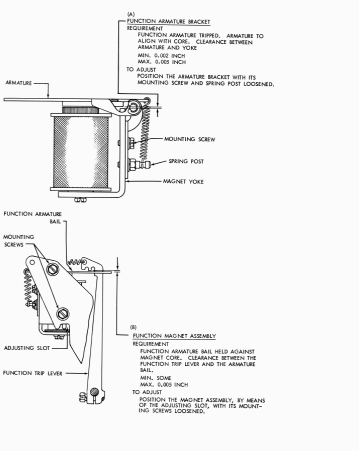


FIGURE 4. FUNCTION TRIP MAGNET

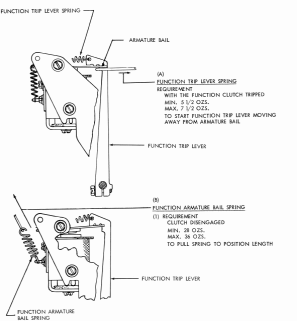


FIGURE 5. FUNCTION TRIP MAGNET

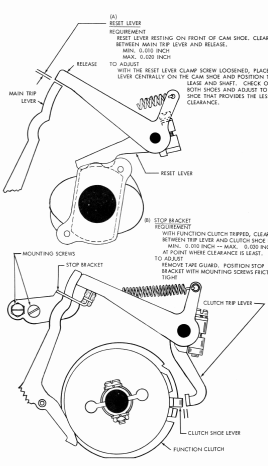


FIGURE 6 FUNCTION MECHANISM

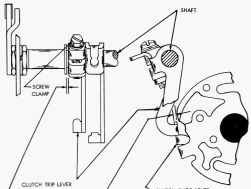


FIGURE 7. CLUTCH TRIP MECHANISM

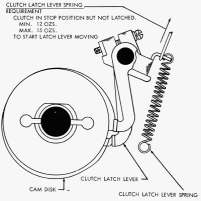


FIGURE 8. CLUTCH TRIP MECHANISM

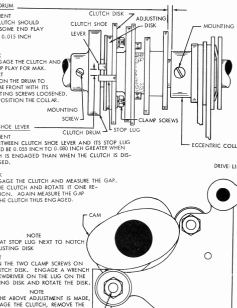


FIGURE 9. MAIN SHAFT AND ROCKER RAIL

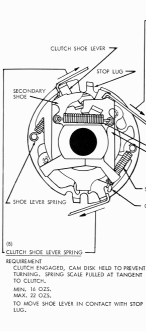


FIGURE 10. CLUTCH MECHANISM

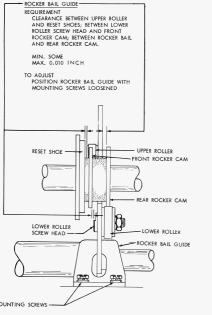


FIGURE 11. ROCKER BAIL GUIDE

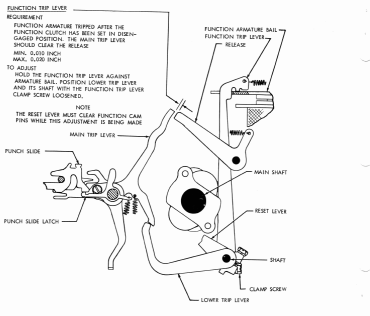


FIGURE 12. FUNCTION TRIP MECHANISM

RESET LEVER

REQUIREMENT

FUNCTION ARMATURE TRIPPED. SHAFT ROTATED UNTIL RESET LEVER IS AT END POINT OF CAM SHOE. CLEARANCE BETWEEN ARMATURE BAIL AND FUNCTION TRIP LEVER.

MIN. 0.005 INCH
MAX. 0.015 INCH

TO ADJUST

WITH RESET LEVER CLAMP SCREW LOOSENED, PLACE THE RESET LEVER CENTRALLY ON A CAM SHOE. HOLD THE RESET LEVER AGAINST THE CAM SHOE AND ADJUST THE FUNCTION TRIP LEVER AND SHAFT. CHECK ON BOTH SHOES AND ADJUST TO THE SHOE THAT PROVIDES THE LESSER CLEARANCE.

NOTE

RECHECK THE FUNCTION TRIP LEVER ADJUSTMENT AND REFINE BOTH ADJUSTMENTS IF NECESSARY

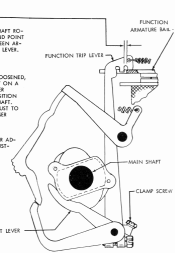


FIGURE 13. FUNCTION TRIP MECHANISM

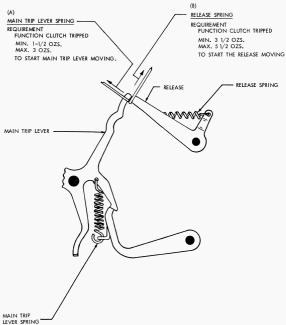


FIGURE 14. RESET MECHANISM

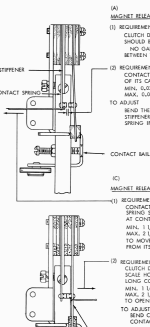
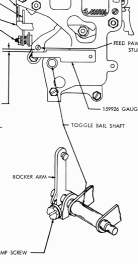


FIGURE 13. MAGNET RELEASE CONTACT

PUNCH MECHANISM

NOTE

BEFORE PROCEEDING WITH THE PUNCH UNIT ADJUSTMENTS, CHECK THE ROCKER RAIL ROLLER ADJUSTMENT



PUNCH ROCKER ARM POSITION

REQUIREMENT

WITH BLANK CODE COMBINATION SELECTED AND THE UPPER ROCKER RAIL ROLLER ON THE HIGH PART OF ITS CAM, PUNCH SLIDE GUIDE REMOVED, DOWNSTOP STUDS LOOSENED, GAUGE NO. 139126 APPLIED TO THE PUNCH UNIT, CLEARANCE BETWEEN THE GAUGE AND THE FEED PAWL STUD

MIN. 0.002 INCH

MAX. 0.003 INCH

WHEN PLAY IN DRIVE LINK IS TAKEN UP FOR MINIMUM CLEARANCE.

TO ADJUST

POSITION THE TOGGLE RAIL SHAFT AND, IF NECESSARY, THE ROCKER ARM SCREW, POSITION THE ROCKER ARM HORIZONTALLY TO PROVIDE AT LEAST 0.005 END PLAY OF THE SHAFT. PLACE DOWNSTOP PLATE IN LOWERMOST POSITION AND TIGHTEN THE DOWNSTOP STUD. REPLACE THE PUNCH SLIDE GUIDE SO THAT EACH SLIDE IS IN ALIGNMENT WITH ITS RESPECTIVE PUNCH PIN.

FIGURE 15. PUNCH MECHANISM

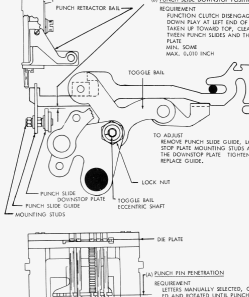


FIGURE 17. PUNCH MECHANISM

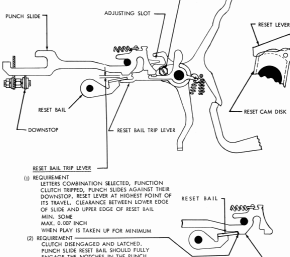


FIGURE 18. PUNCH SLIDE TRIP MECHANISM

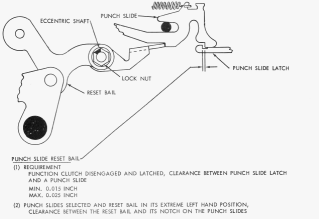


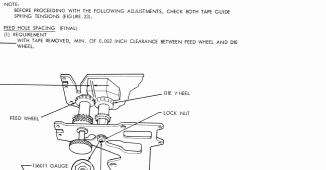
FIGURE 19. PUNCH UNIT RESET AND FEEDING MECHANISM

FEED HOLE SPACING (PRELIMINARY)
REQUIREMENT
WITH INDENT OF DIE WHEEL ECCENTRIC STUD POINTING DOWNWARD, CLEARANCE BETWEEN DIE WHEEL AND FEED WHEEL
---MIN. 0.002 INCH----------MAX. 0.004 INCH

TO ADJUST
POSITION DIE WHEEL ECCENTRIC STUD WITH LOCK NUT LOOSENED.

NOTE:
BEFORE PROCEEDING WITH THE FOLLOWING ADJUSTMENTS, CHECK BOTH TAPE GUIDE SPRING TENSIONS (FIGURE 23).

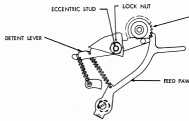
FEED HOLE SPACING (FINAL)
(1) REQUIREMENT
WITH TAPE REMOVED, MIN. OF 0.002 INCH CLEARANCE BETWEEN FEED WHEEL AND DIE WHEEL.



(2) TO CHECK
PERFORATE IN ORDER (IN SEQUENCE) MADE UP OF NINE BLANK CODE COMBINATIONS FOLLOWED BY 4 LETTERS COMBINATION. OPEN CHADS SO THAT CODE HOLES ARE VISIBLE. PLACE TAPE OVER SMOOTH SIDE OF 1401 TAPE GAUGE SO THAT FIRST NO. 2 CODE HOLE IS CONCENTRIC WITH FIRST (0.072 INCH) HOLE IN GAUGE (SEE NOTE BELOW). REQUIREMENT
SECOND THROUGH FIFTH HOLE IN GAUGE VISIBLE THROUGH NO. 2 CODE HOLES IN TAPE. SIXTH HOLE IN GAUGE COVERED BY NO. 2 CODE HOLE ENTIRELY WITHIN CORRESPONDING (0.072 INCH) HOLE IN GAUGE.
(2R) REQUIREMENT
WITH TAPE SHOE HELD AWAY FROM FEED WHEEL, FEED PAWL AND DETENT DISENGAGED AND TAPE REMOVED, FEED WHEEL SHOULD ROTATE FREELY.
TO ADJUST
WITH TAPE REMOVED, KEEPING INDENT IN/OUT CENTER OF STUD, POSITION DIE WHEEL ECCENTRIC STUD WITH LOCK NUT LOOSENED SO THAT CLEARANCE BETWEEN FEED WHEEL AND DIE WHEEL IS
---MIN. 0.002 INCH----------MAX. 0.004 INCH.
(3) REPEAT THE ABOVE ADJUSTMENT TO MEET REQUIREMENT (2). MOVE INDENT IN ECCENTRIC STUD TOWARD FEED WHEEL TO DECREASE AND AWAY FROM FEED WHEEL TO INCREASE CLEARANCE. CAUTION: WITH TAPE REMOVED, MAKE SURE FEED WHEEL-DIE WHEEL CLEARANCE IS A MIN. OF 0.002 INCH.
(3) FAILURE TO MEET REQUIREMENT (2) INDICATES DIE WHEEL ECCENTRIC STUD HAS BEEN OVER ADJUSTED. REPEAT (2).

NOTE:
FIRST THROUGH FIFTH HOLES IN GAUGE ARE SAME SIZE AS CODE HOLES IN TAPE (0.072 INCH DIAMETER). BUT SIXTH HOLE IN GAUGE IS LARGER (0.086 INCH). THIS ARRANGEMENT ALLOWS 0.002 INCH VARIATION IN 2 HOLES.

FIGURE 29. TAPE FEED MECHANISM



DETENT

REQUIREMENT

A PIECE OF TAPE CONTAINING NINE FEED HOLES FOLLOWED BY A LETTERS COMBINATION PERFORATED ON THE REPERFORATOR MUST CONFORM TO THE 13601 TAPE GAUGE.

THE LATERAL CENTERLINE THROUGH THE CODE HOLES IN THE TAPE SHOULD COINCIDE WITH A LATERAL CENTERLINE THROUGH THE HOLES IN THE GAUGE.

TO ADJUST

ROTATE THE DETENT ECCENTRIC CLOCKWISE TO MOVE THE FEED HOLES TOWARD THE HINGED EDGE OF THE CODE HOLES AND COUNTERCLOCKWISE TO MOVE THE FEED HOLES TOWARD THE TRAILING EDGE OF THE CODE HOLES. TIGHTEN THE ECCENTRIC LOCK NUT AND REFINE THE FEED PAWL ADJUSTMENT.

RECHECK FEED PAWL ADJUSTMENT

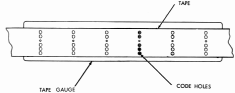


FIGURE 21. PUNCH DETENT

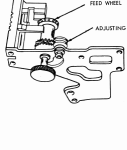


FIGURE 22. TAPE FEED MECHANISM

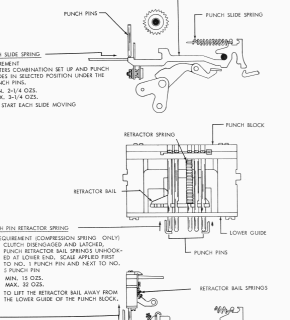


FIGURE 23. PUNCH MECHANISM

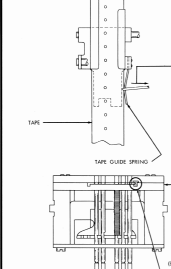
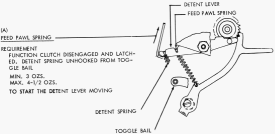


FIGURE 24. PUNCH MECHANISM



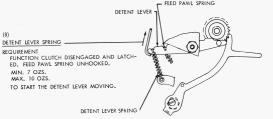


FIGURE 25. TAPE FEED MECHANISM

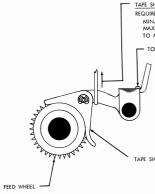
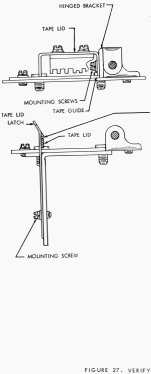


FIGURE 26. FEED WHEEL

E. VERIFYING READER

NOTE
ALL ADJUSTMENTS SHOULD BE MADE WITH THE LEFT COVER PLATE REMOVED



(A) TAPE LID

REQUIREMENT
WITH THE TAPE LID HELD DEPRESSED AGAINST THE TOP PLATE, THE LID SHOULD TOUCH THE GUIDE AT BOTH BEARING POINTS

TO ADJUST
LOOSEN TWO SCREWS WHICH SECURE THE TAPE LID TO THE HINGED BRACKET. HOLD THE TAPE LID DEPRESSED AND TIGHTEN THE SCREWS.

(B) TAPE LID CLEARANCE

REQUIREMENT
WITH TAPE LID HELD CLOSED, THE LATCH SHOULD MOVE FREELY OVER THE LATCHING SURFACE WITH

MINIMUM CLEARANCE

TO ADJUST
POSITION THE TAPE LID LATCH WITH ITS MOUNTING SCREW LOOSENED.

NOTE
IT MAY BE NECESSARY TO OPERATE THE MECHANISM TO GAIN ACCESS TO THE SCREW

FIGURE 27. VERIFYING READER TAPE LID

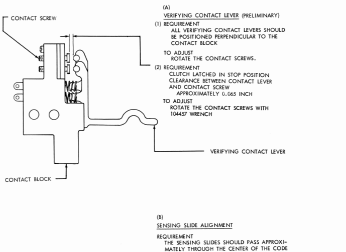
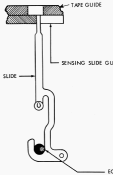
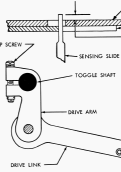


FIGURE 28. VERIFYING CONTACTS



(A)
SENSING SLIDE
REQUIREMENT
WITH THE PUNCH DRIVE LINK IN ITS EXTREME EIGHTH-AND POSITION AND THE CLUTCH DISENGAGED (UNLATCHED), THE TOP OF THE HIGHEST PIN SHOULD BE FLUSH TO 0.000 BELOW THE TAPE GUIDE.

TO ADJUST
ROTATE THE SENSING SLIDE ECCENTRIC GUIDE POST WITH ITS LOCK NUT LOOSENED, KEEPING THE HIGH PART OF THE ECCENTRIC TOWARD THE LEFT



(B) SENSING SLIDE STROKE

REQUIREMENT
WITH THE PUNCH DRIVE LINK IN ITS EXTREME LEFT POSITION, THE HIGHEST SENSING SLIDES SHOULD EXTEND ABOVE TOP OF GUIDE

MIN. 0.040 — MAX. 0.070 INCH

TO ADJUST
POSITION THE TOGGLE SHAFT IN THE VERIFIER DRIVE ARM WITH THE CLAMP SCREW LOOSENED.

FIGURE 29. SENSING SLIDES

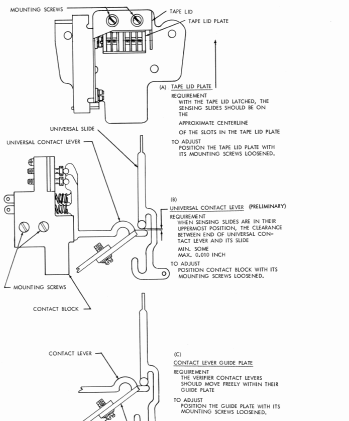
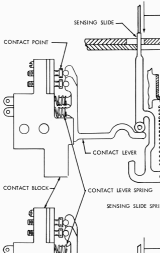


FIGURE 20. SENSING SLIDES



CONTACT GAP (FINAL)

REQUIREMENT
THE UNIVERSAL CONTACTS SHOULD CLOSE AFTER READING CONTACTS HAVE CLOSED AND SHOULD OPEN BEFORE THE CODE READING CONTACTS OPEN.

TO CHECK
USE A 100 WPM TYPE DISTORSION TEST SET WITH A 220 WPM TYPE SCALE. VIEW THE SHORTER SIGNALS FOR EACH CONTACT. THE UNIVERSAL CONTACT CLOSURE SHOULD BE 120 — 20 UNITS ON THE 7-42 CODE ARRANGEMENT. THE CODE READING CONTACTS SHOULD BE 110 — 10 UNITS.

TO ADJUST
TURN THE RESPECTIVE CONTACT SCREW

NOTE
THE VERIFYING READER SHOULD ACTUALLY BE READING THE LETTERS CODE COMBINATION TAPE TO ADJUST CONTACT GAP PROPERLY.

FIGURE 31. VERIFYING CONTACTS AND SENSING SLIDES

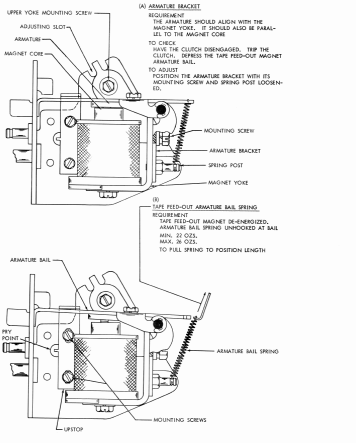
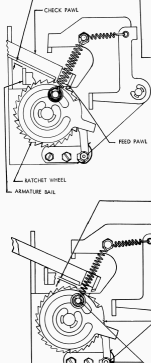


FIGURE 32. TAPE FEED-OUT MAGNE



(A)

TAPE FEED-OUT MAGNET ASSEMBLY

REQUIREMENT

ARMATURE BAIL IN ENERGIZED POSITION, THE CHECK PAWL AND FEED PAWL EACH IN DEEP NOTCH OF THEIR RESPECTIVE RATCHET WHEEL. THE ARMATURE BAIL SHOULD CLEAR EACH PAWL

MIN. 0.010 INCH
MAX. 0.020 INCH

THROUGHOUT A COMPLETE REVOLUTION OF THE MAIN SHAFT.

TO CHECK

HAVE THE CLUTCH DISENGAGED. TRIP THE CLUTCH. DEPRESS THE ARMATURE BAIL AND HOLD IT WHILE ROTATING THE MAIN SHAFT A COMPLETE REVOLUTION

TO ADJUST

POSITION THE MAGNET ASSEMBLY, BY MEANS OF ITS ADJUSTING SLOT, WITH THE UPPER AND LOWER YOKE MOUNTING SCREWS LOOSENED. SEE FIGURE 32.

ARMATURE LIFTSTOP

REQUIREMENT

WITH THE ARMATURE BAIL RELEASED, BOTH THE FEED PAWL AND CHECK PAWL SHOULD CLEAR THE RATCHET WHEEL TEETH

MIN. 0.002 INCH
MAX. 0.007 INCH

TO ADJUST

POSITION THE ARMATURE LIFTSTOP BY MEANS OF ITS ADJUSTING SLOT WITH ITS MOUNTING SCREWS LOOSENED. SEE FIGURE 32.

(B)

TAPE FEED-OUT LENGTH

REQUIREMENT

THE ADJUSTING PLATE ON THE RATCHET WHEELS SHOULD BE POSITIONED TO PERMIT THE DESIRED LENGTH OF TAPE TO BE FED OUT.

TO ADJUST

POSITION THE ADJUSTING PLATE WITH ITS LOCK NUT LOOSENED.

SCALE HOOKED NEAR UPPER END OF DETENT. FULL DETENT TO VERTICAL POSITION.

MIN. 1 OZ.
MAX. 2 OZS.

TO ADJUST

POSITION DETENT SPRING WITH LOCK NUT LOOSENED.

FIGURE 33. TAPE FEED-OUT MECHANISM

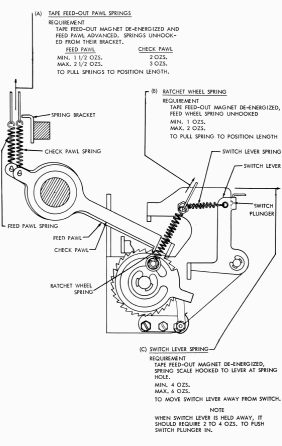


FIGURE 34. TAPE FEED-OUT MECHANISM

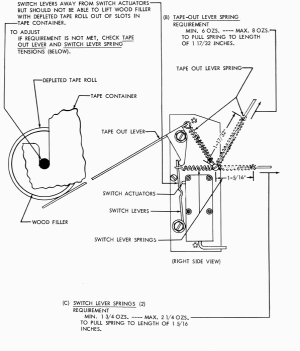
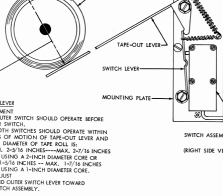


FIGURE 35. TAPE-OUT MECHANISM

NOTE:
THE INNER ELEMENTS ARE THESE NEARER THE MOUNTING PLATE; THE OUTER ELEMENTS, THOSE FARTHER FROM THE MOUNTING PLATE.



SWITCH LEVER
REQUIREMENT
(1) OUTER SWITCH SHOULD OPERATE BEFORE INNER SWITCH.
(2) BOTH SWITCHES SHOULD OPERATE WITHIN LIMITS OF MOTION OF TAPE LEVER AND WHEN DIAMETER OF TAPE ROLL IS
MAX. 2-7/16 INCHES WHEN USING A 2-INCH DIAMETER CORE OR
MIN. 1-5/16 INCHES MAX. 1-7/16 INCHES WHEN USING A 1-INCH DIAMETER CORE.
TO ADJUST
BEND OUTER SWITCH LEVER TOWARD SWITCH ASSEMBLY.
NOTE:
ADJUSTMENT CAN BE FACILITATED BY REMOVING SWITCH MECHANISM FROM TAPE CONTAINER.

SWITCH MECHANISM MOUNTING PLATE
REQUIREMENT
OUTER SWITCH SHOULD JUST OPERATE WHEN DIAMETER OF TAPE ROLL IS REDUCED TO
APPROXIMATELY 2-3/8 INCHES,
WHEN USING A 2-INCH DIAMETER CORE OR APPROXIMATELY 1-3/8 INCHES WHEN USING A 1-INCH DIAMETER CORE.

TO ADJUST
BEND OUTER SWITCH TOWARD SWITCH ASSEMBLY
NOTE:
ADJUSTMENT CAN BE FACILITATED BY REMOVING SWITCH MECHANISM FROM TAPE CONTAINER.

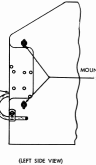


FIGURE 26. TAPE-OUT MECHANISM

TAPE CONTAINER POSITION

(1) REQUIREMENT
THERE SHOULD BE ADEQUATE CLEARANCE BETWEEN THE TAPE FEED-OUT MOUNTING BRACKET AND THE WIRE TAPE GUIDE MOUNTING SCREW.

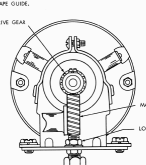
TO ADJUST
POSITION THE TAPE CONTAINER WITH ITS MOUNTING SCREWS LOOSENED

(2) REQUIREMENT
THERE SHOULD BE ADEQUATE CLEARANCE BETWEEN THE TAPE CONTAINER AND THE FUNCTION MAGNET ARMATURE SPRING.

TO ADJUST
POSITION THE REFRIGERATOR CASTING WITH ITS MOUNTING SCREWS LOOSENED.

(3) REQUIREMENT
THE TAPE SHOULD BE ALIGNED WITH THE TAPE CHUTE

TO ADJUST
BEND THE WIRE TAPE GUIDE.



MOTOR GEAR
REQUIREMENT
THERE SHOULD BE A BARELY PERCEPTIBLE AMOUNT OF BACKLASH BETWEEN THE MOTOR DRIVE GEAR AND THE MAIN SHAFT DRIVEN GEAR AT THE POINT WHERE BACKLASH IS THE LEAST.

TO ADJUST
ROTATE THE ADJUSTING STUD WITH ITS LOCK NUT LOOSENED

CAUTION
IF THE MOTOR SHOULD BECOME BLOCKED FOR SEVERAL SECONDS, THE THERMAL CUT-OUT SWITCH WILL BREAK THE CIRCUIT. SHOULD THIS HAPPEN, ALLOW THE MOTOR TO COOL AT LEAST 2 MINUTES BEFORE MANUALLY DEPRESSING THE RED BUTTON. AVOID REPEATED DEPRESSIONS.

FIGURE 37. MOTOR

SECTION 2

DISASSEMBLY AND REASSEMBLY

1. GENERAL

a. For illustrations of parts referred to herein, see Teletype Multi-Magnet Reperforator Parts Bulletin 116B.

NOTE

When removing a part which is mounted on shims, the number of shims used at each mounting screw should be noted so that the same shim pile-ups can be replaced when the part is remounted. Retaining rings (truarc) are of spring steel and have a tendency to release suddenly. Loss of these can be minimized as follows: Hold retaining ring with the left hand to prevent rotation. Place the blade of a suitable screwdriver in one of the slots of the retaining ring. Rotate the screwdriver in a direction to increase the diameter of the retaining ring. It will come off easily without flying.

b. Reperforator

(1) To remove the reperforator from the base, proceed as follows:

(a) Remove the two cable clamps that retain the reperforator cable on the base.

(b) Disconnect the reperforator cable from the three terminal blocks on the base.

(c) Remove the 151631 screw, 2191 lock washer and 7002 washers that anchor the reperforator to the base plate.

(d) Remove the three 156087 screws, 2869 lock washers and 3438 Flat washers (Figure 3) from the base and remove the reperforator.

(e) To replace the reperforator, reverse the procedure followed in removing it. Route and connect the cables to the terminal blocks on the base as shown on Wiring Diagram 325BWD.

(2) Verifying Reader

(a) Remove the two cable clamps from the reader cable.

(b) Disconnect the reader cable leads from the middle terminal block at the rear of the base.

(c) Remove the 151722 screw and 2191 lock washer that secure the lower mounting extension of the rear plate of the reader to the rear plate of the perforator unit (Figure 4).

(d) Remove the two lower 152890 screws and 3640 lock washers from the front and rear plates supporting the punch block (Figure 4). Replace the screws and lock washers after detaching the reader.

(e) Disengage the 139029 toggle shaft arm from the drive link slot and remove the reader.

(f) To replace the reader, reverse the procedure followed in removing it. Connect the cable to the middle terminal block as shown on Wiring Diagram 325BWD.

(3) Tape Feed-Out Assembly

(a) Remove the cable clamp that retains the cable on the base.

(b) Disconnect the cable leads from the lower terminal block at the rear of the base.

(c) Remove the two 151630 screws and 2191 lock washers which mount the feed-out assembly to the main frame (Figure 12).

(d) To replace the assembly, reverse the procedure followed in removing it.

(4) Perforator Unit

(a) Unhook the 74701 rocker arm spring (Figure 11).

(b) Remove the 151630 screw, 2191 lock washer and 7002 washer that anchor the perforator unit to the base plate (Figure 3).

(c) Remove the two 151630 screws and 2191 lock washers; the 151632 screw, 2191 lock washer and 7002 flat washer that secure the unit to the main plate (Figure 4).

(d) Disengage the rocker arm from its slot in the drive link and remove the unit.

(e) To replace the unit, reverse the procedure followed in removing it. Make certain that the 156-039 slide bar reset bail (Figure 6) engages the 139430 trip lever (Figure 12).

(5) Magnet Release Contact Assembly

(a) Unhook, at the upper end, the 110427 springs (Figure 14) attached to the tape feed-out panel and the check panel (Figure 12).

(b) Unsolder the wires at the cable at the contact terminals.

(c) Remove the cable clamp holding the cable to the frame.

(d) Remove the two 131631 screws and 2191 lock washers that secure the contact assembly (Figure 14) and remove the contact assembly.

(e) To replace the contact assembly, reverse the procedure followed in removing it.

(6) Function Magnet Assembly

(a) Unsolder the wires from the function magnet (Figure 16).

(b) Remove the 82725 function trip lever spring and the 74962 armature spring.

(c) Remove the two 131632 screws and 2191 lock washers (Figure 16) which secure the magnet assembly and remove it.

(d) To replace the assembly, reverse the procedure followed in removing it.

(7) Code Selector Mechanism

(a) Disconnect the code magnet cable from the upper terminal block on the base.

(b) Remove the cable clamp holding the cable to the base.

(c) Remove the two 3398 nuts, 131632 screws and 2191 lock washers that secure the code selector mechanism plate to the main plate (Figure 10) and remove the mechanism.

(d) To replace the mechanism, reverse the procedure followed in removing it. Make certain that the 112631 spring is hooked to the 136472 spring post and that the rods associated with the code magnet armatures are in position.

(8) Rocker Bail Assembly

(a) Unhook the 74701 spring from the drive link (Figure 11).

(b) Remove the retaining ring from the 136366 rocker bail shaft at the rear of the rocker bail (Figure 11).

(c) Remove the nut, lock washer and flat washer from the outer end of the rocker bail shaft and pull the shaft from the main casting.

(d) To replace the assembly, reverse the procedure followed in removing it. Make certain to position the two 95814 spacers as shown on Figure 11.

(9) Function Trip Shaft Assembly (139025)

(a) Unhook the 82725 spring from the 139023 function trip lever (Figure 13).

(b) Unclamp and remove the 139023 function trip lever.

(c) Unclamp and remove the 139033 lower reset lever.

(d) Remove the 74547 collar.

(e) Withdraw the 139025 shaft assembly.

(f) To replace the assembly, reverse the procedure followed in removing it.

(10) Clutch Trip Shaft Assembly (139546)

(a) Remove the 90373 spring from the release (Figure 13).

(b) Remove the 112631 spring (Figure 10) from the 130355 clutch latch lever (Figure 13).

(c) Unclamp and remove the 130173 clutch lever reset cam.

(d) Remove the 130355 clutch latch lever.

(e) Unclamp and remove the 130356 clutch trip lever.

(f) Withdraw the clutch trip shaft assembly.

(g) To replace the clutch trip shaft assembly, reverse the procedure followed in removing it.

(11) 136474 Bar and 138934 Stop Bracket (Figure 13).

(a) Remove the code selector mechanism as described in paragraph 1.b.(7).

(b) Remove the 131630 screw and 2191 lock washer that secure the 138934 stop bracket (Figure 13).

(c) Remove the 131693 screw and 2191 lock

washer that secure the 136474 bar to the main casting and remove the bar.

(d) To replace the bar and stop bracket reverse the procedure followed in removing it.

(12) Main Shaft Assembly

(a) Remove the code selector mechanism as described in paragraph 1.b.(7).

(b) Remove the gear hub with the gear from the rear end of the shaft.

(c) Remove the 136402 bearing retainer (Figure 11) at the front end of the shaft.

(d) Remove the 119655 retainer ring, 151639 washer and 151638 spring washer (Figure 11) from the outer side of both front and rear bearings.

(e) Remove the 119656 retainer ring associated with the feed out metering mechanism (Figure 12).

(f) Remove the 151632 screw and 2191 lock washer that secures the 136153 eccentric collar to the main shaft (Figure 12).

(g) Remove the 150040 screw and 2191 lock washer that secures the 150000 clutch drum to the main shaft.

(h) Slide the front and rear bearings off the shaft.

(i) Push the shaft toward the front so that the rear end of the assembly can be pivoted out of the rear bearing mounting hole and then withdraw it from the front bearing mounting hole.

(j) Replace the hardware removed in steps (f) and (g).

(k) To replace the main shaft, reverse the procedure followed in removing it.

(13) Transfer Mechanism

(a) Remove the three 151632 screws, 2191 lock washers and one 7002 Flat washer that secure the 139-473 main plate (Figure 13) and remove the main plate assembly.

(b) Remove the two 151737 screws and 110743 lock washers that secure the 139011 spring bracket (Figure 13) to the main plate and remove the bracket.

(c) To replace the transfer mechanism, reverse the procedure followed in removing it.

SECTION 3

LUBRICATION

1. GENERAL

a. The Reperforator should be lubricated before being stored or placed in service. After a few weeks of service, relubricate to make certain that all points receive lubrication. Thereafter relubricate every 1500 hours of operation or every six months, whichever comes first.

b. Use Teletype KS-7470 oil at all locations where the use of oil is indicated. Use KS-7471 grease on all surfaces where grease is indicated, except the motor bearings. Apply two drops of KS-7470 oil to motor bearings every four months (depress oiler with metal object). If the motor is disassembled at any time, repack the bearings with KS-7471 grease. Do not repack bearings otherwise.

c. Apply a thin film of grease to all gears. Apply oil to all cams, including the camming surfaces of each clutch disk. All sliding surfaces are to be lubricated to prevent wear. All pivot points, spring ends and felt washers are to be lubricated with oil.

d. Unless otherwise specified, one or two drops of oil at each of the places indicated will be sufficient. Oil both loops of all helical springs that exert a nominal tension of less than 2-1/2 pounds. Apply grease to both loops of all helical springs that exert a nominal tension of 2-1/2 pounds or more. Use oil for lubrication of all the places listed in the following paragraphs, except where grease is specified.

2. LUBRICATION POINTS

Part	Lubricate At	Lubricant
a. Multi-Magnet Code Selector		
(1) Code Armature	Pivot	Oil Lightly
(2) Armature Bracket Spring	Contact With Armature	Oil Lightly
(3) Rod	Bearing Surfaces	Oil Lightly
(4) Punch Slide Latch	Pivot, Armature	Oil
	Rod, Punch Slide	Oil
b. Function Mechanism		
(1) Function Magnet Armature	Pivot	Oil
	Function Trip Lever	Grease
(2) Reset Cam	Pins On Reset Disk	Grease
(3) Reset Lever	Pins On Reset Disk	Grease
(4) Main Trip Lever	Pivot	Oil
	Release	Grease
	Lower Trip Lever	Grease
	Reset Bail Trip Lever Fork	Grease
(5) Clutch Trip Lever	Clutch Shoe Lever	Grease
(6) Clutch Latch Lever	Clutch Disk	Grease
(7) Clutch Trip Shaft	Pivots	Oil
(8) Rocker Bail Rollers	Cam Surfaces	Grease
(9) Shaft	Pivots	Oil
(10) Drive Link	Rocker Ball	Oil
c. Main Shaft Assembly		
(1) Clutch Disk	Latch Lever	Grease
(2) Clutch Shoe Lever	Clutch Trip Lever	Grease
(3) Clutch Mechanism	Internal Components	Oil
(4) Cam Assembly	Disk Pins	Grease
	Rollers	Grease
(5) Main Shaft	Bearings	Oil & Grease
(6) Magnet Release Contact Bail Assembly	Pivot	Oil
	Roller	Grease

Part	Lubricate At	Lubricant
(7) Feed Pawl And Check Pawl	Eccentric Collar	Oil
d. Punch Mechanism		
(1) Rocker Arm	Pivot And Spring Wick	Oil
(2) Drive Link	Pivots	Oil
(3) Toggle Bail	Bearing Felt Oilers	Oil
(4) Toggle Links (2)	Bearing Felt Oilers	Oil
(5) Punch Slide Reset Bail	Bearing Felt Oilers	Oil
(6) Punch Slide Post	Felt Oiler	Oil
(7) Punch Slides	Pivot And Sliding Surfaces	Oil
(8) Punch Slide Guide	Slots	Oil
(9) Punch Slide Springs	Hooks	Oil
(10) Detent	Pivot, Roller, Spring Hooks	Oil
(11) Feed Pawl	Pivot, Spring Hooks	Oil
(12) Detent Spring	Wick	Oil
(13) Feed Pawl	Wick	Oil
(14) Feed Wheel	Felt Oiler Ratchet Wheel Teeth	Oil
(15) Die Wheel	Felt Washer	Oil
(16) Tape Shoe Arm	Pivot	Oil
(17) Tape Shoe	Pivot	Oil
(18) Feed Wheel Shaft	Bearing (Knob-end)	Oil
(19) Punch Retractor Bail (2)	Pivot And Felt Oiler	Oil
(20) Punch Pin	Guides (2), Retractor Notches	Oil
(21) Retractor Springs	Spring Hooks And Compression Springs	Oil
e. Verifying Reader		
(1) Toggle	Pivots	Oil
(2) Tape Lid	Pivots	Oil
(3) Sensing Slides	Bearing Surfaces	Oil
(4) Slide Guides	Slots	Oil
(5) Contact Lever Guide	Slots	Oil
(6) Drive Link	Rocker Arm Pivots	Grease
(7) Contact Lever	Pivots, Sensing Slides	Grease
f. Tape Feed-Out Mechanism		
(1) Armature Bail	Pivots	Oil
	Feed Pawl And Check Pawl	Grease
(2) Armature Spring	Hooks	Oil
(3) Switch Lever	Pivot, Spring Hooks	Oil
	Plunger	Grease
(4) Ratchet Wheel	Bearing, Teeth, Spring Hooks	Oil
(5) Feed Pawl And Check Pawl	Eccentric Pivot	Oil
(6) Feed Pawl And Check Pawl Springs	Hooks	Oil
(7) Felt Oilers	All	Oil
g. Base		
(1) Tape-Out Lever	Pivot, Spring Hooks	Oil
(2) Tape-Out Switch Lever	Pivot, Spring Hooks	Oil
h. Motor Oilers	Each End	Oil
i. Gears	Teeth	Grease