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TELETYPE

PRINTING TELEGRAPH SYSTEMS

DESCRIPTION AND ADJUSTMENTS OF THE START-STOP REGENERATIVE REPEATER REGENERATOR UNIT AND PANEL





DESCRIPTION AND ADJUSTMENTS OF THE START-STOP REGENERATIVE REPEATER

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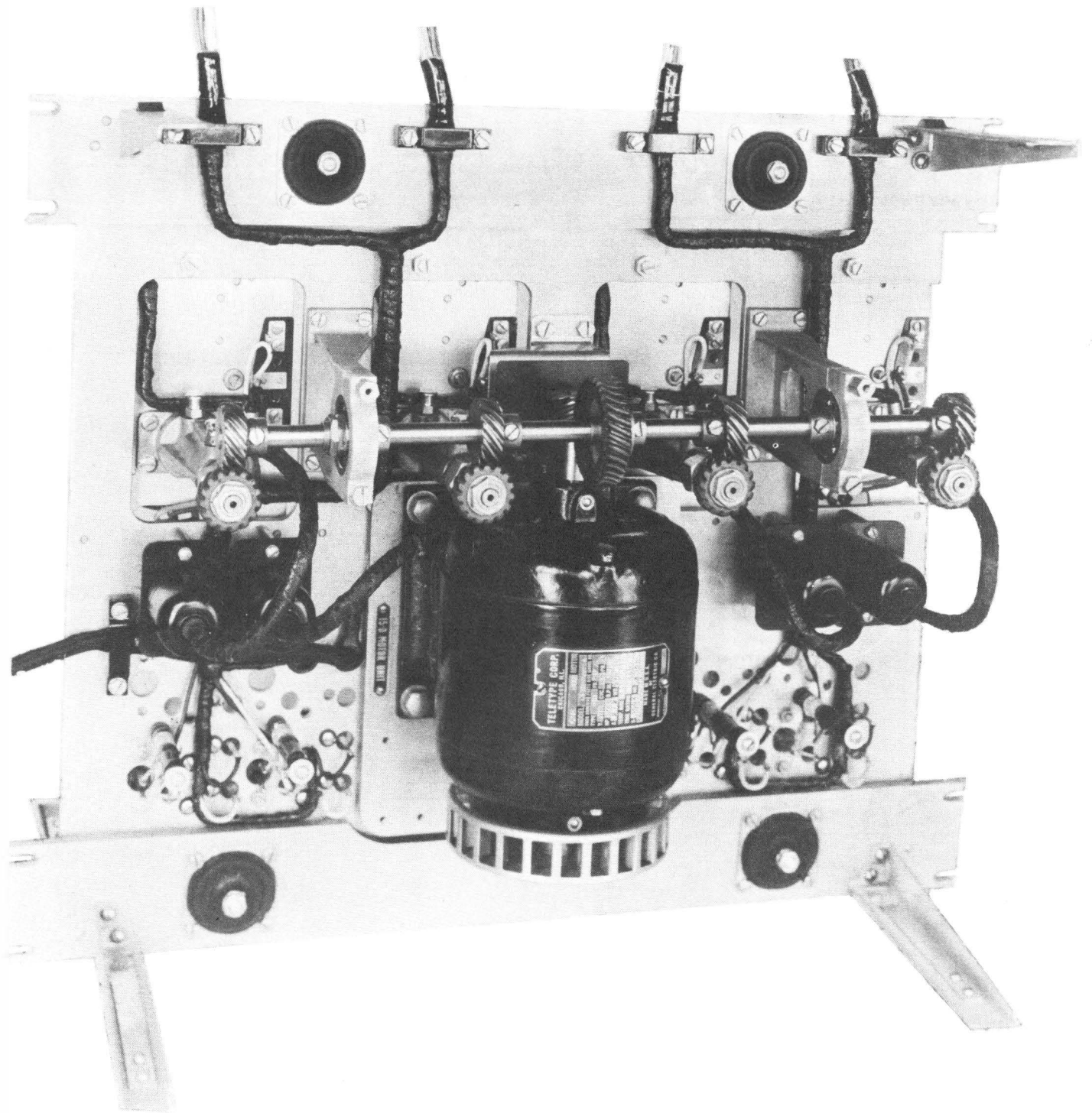


ILLUSTRATION 1

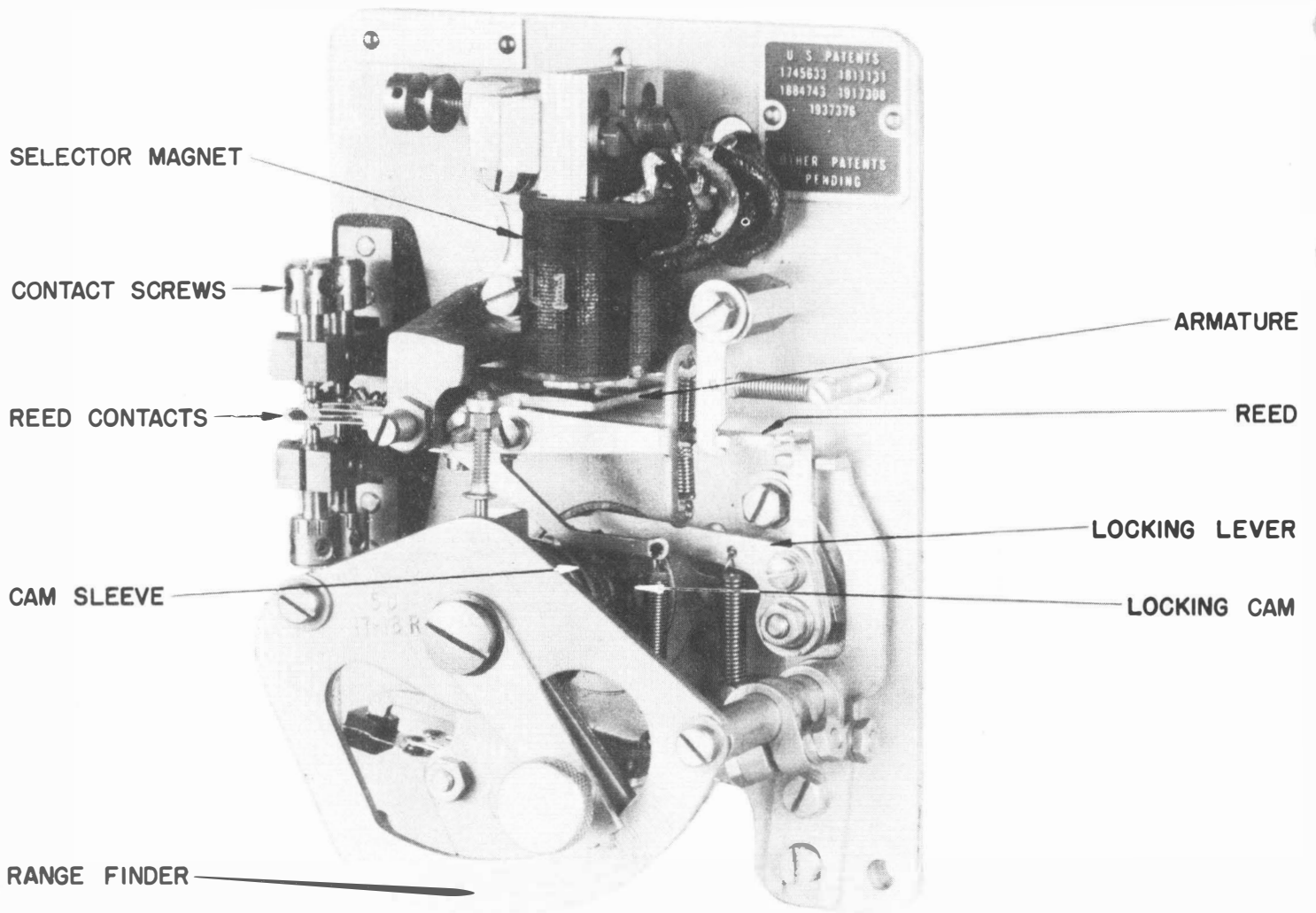


ILLUSTRATION 2

DESCRIPTION OF THE START-STOP REGENERATIVE REPEATER

INTRODUCTION

Ordinary repeaters are used in telegraph circuits for the purpose of strengthening the current and minimizing the detrimental effects of induction from other wires. Where a line is too long to permit printer operation at high speeds, repeaters are inserted to divide the line into short sections.

The ordinary type of repeater strengthens the current for the next line section but does not correct any variation in the lengths of the signals. Where a circuit is long and contains many such repeaters, it is not possible to maintain as high a speed of operation as on the shorter circuits due to the accumulative distortion caused by the many line sections and repeaters.

The start-stop regenerative repeater, as described in this bulletin, not only strengthens the current for the next line section, but will also correct any distortion of the received signals, so that the repeated signals will be as perfect as the signals originally sent from the transmitting terminal station.

General

One or more start-stop regenerative repeaters may be used in each long printer circuit to permit a higher speed of operation to be maintained.

Four regenerator units and one motor may be mounted on one regenerator panel (Illustration 1). One motor supplies power for four regenerator units. One regenerator unit is required to regenerate a start-stop printer circuit in each direction at designated regenerative repeater stations.

NOTE: In all figures of this bulletin, fixed pivot points are noted by solid black circles.

REGENERATOR UNIT

A regenerator unit (Illustration 2) consists essentially of the following mechanism: A selector magnet (holding type) and armature for receiving the signals; a range finder for orientating the cam sleeve to the received signals; a locking lever, locking cam, and reed for regenerating the signal; a reed contact assembly and contact screws for transmitting the regenerated signal; and a main shaft and cam sleeve assembly.

Main Shaft Assembly (Figures 1 and 2)

The main shaft is located to the rear of the range finder and is mounted horizontally. It is driven by the motor through the medium of the motor pinion, counter shaft, and gears.

The cam sleeve assembly includes the armature cam, locking cam, relay holding cam, and stop arm. It is driven through the medium of a friction clutch, which is formed by the cam sleeve clutch spring, four steel discs, and two felt friction washers.

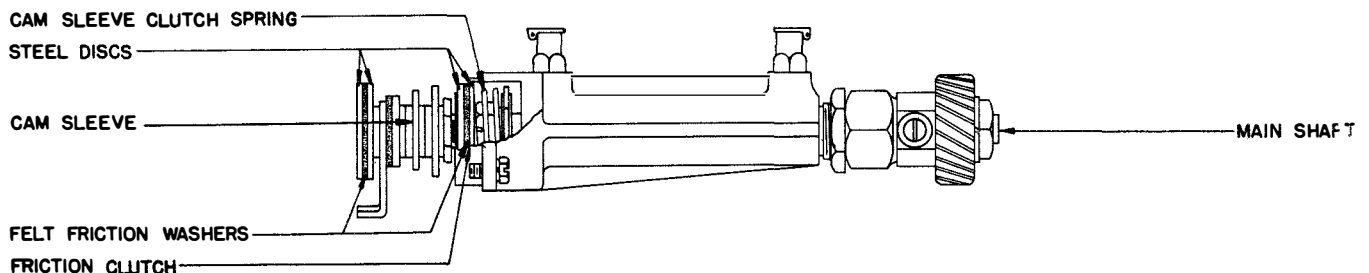


FIGURE 1

Regenerative Mechanism

The purpose of the regenerative mechanism is to receive the signals from the transmitting station, regenerate, and retransmit them. The regenerative mechanism is controlled by the selector magnet which receives the signal impulses from the line. Normally the armature of the selector magnet (Figure 2) is in the operated position, and the cam sleeve stop arm is against the stop lever, which, in turn, is held by the trip latch. Thus the cam sleeve is prevented from revolving.

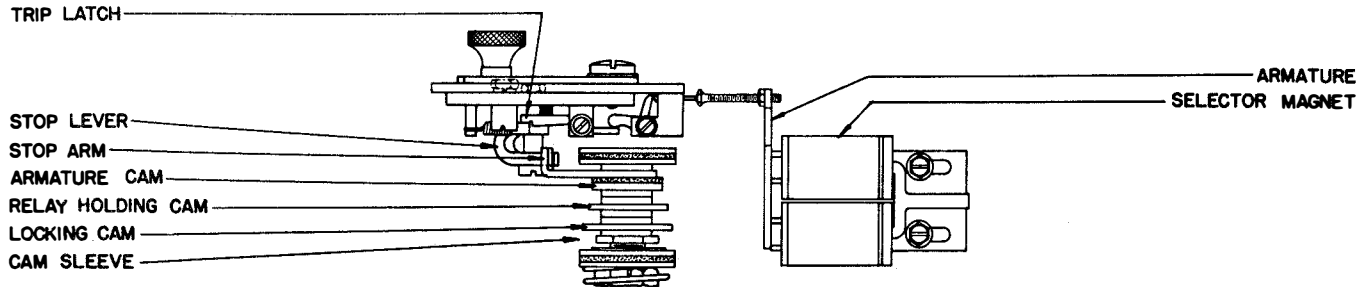


FIGURE 2

When the start impulse, which is spacing (no-current), is received, the armature is released and pulled away from the magnet pole pieces by the armature spring. This will move the trip latch out of engagement with the stop lever, thereby releasing the stop arm, allowing the cam sleeve to revolve with the main shaft.

The reed contacts are fastened to a reed, which is pivoted at the same point as the armature (Figure 3). There are two reed centralizing springs, one end of each hooked to opposite sides of the reed and the other ends hooked to a reed centralizing spring bracket that is fastened to the armature lever. As the armature lever moves, the reed centralizing springs try to assume their neutral balance, thereby causing the reed to follow the travel of the armature lever.

As the cam sleeve revolves, the armature cam moves the armature against the selector magnet. If the impulse received is marking, the armature will be held in its marking position during that impulse. If the received impulse is spacing, the armature will be pulled by its spring back to its spacing position. The tension stored up in one of the reed centralizing springs will move the reed as soon as a high part of the locking cam moves the locking arm of the locking lever away from the end of the reed. When the locking lever leaves the high part of the cam, it will be moved by its spring so that its locking arm will engage the reed, locking it in either its marking or spacing position until the next high part of the locking cam is reached. The distances between the high parts of the locking cam are equivalent to a full length impulse. Thus, it may be seen that the transmitted signals will all be full length, because even if the incoming signal is short, the reed contacts will be locked in position to correspond to the received impulse long enough to transmit a full length impulse.

Relay Holding Contacts

The relay holding contacts (Figure 3) are mounted on a movable bracket which is connected to the movable assembly of the range finder. These contacts are actuated by the relay holding contacts lever and the relay holding cam. This cam is designed so that the relay holding contacts close at all times except in the stop position of the regenerator cam sleeve and during the early portion of the start impulse.

When the repeater is used in connection with half duplex circuits (See W.D. 1638), these contacts control a current, which is applied to the biasing winding of the receiving relay on the retransmitting side of the repeater, to hold the relay tongue on its marking contact. This will prevent repeating back into the receiving circuit.

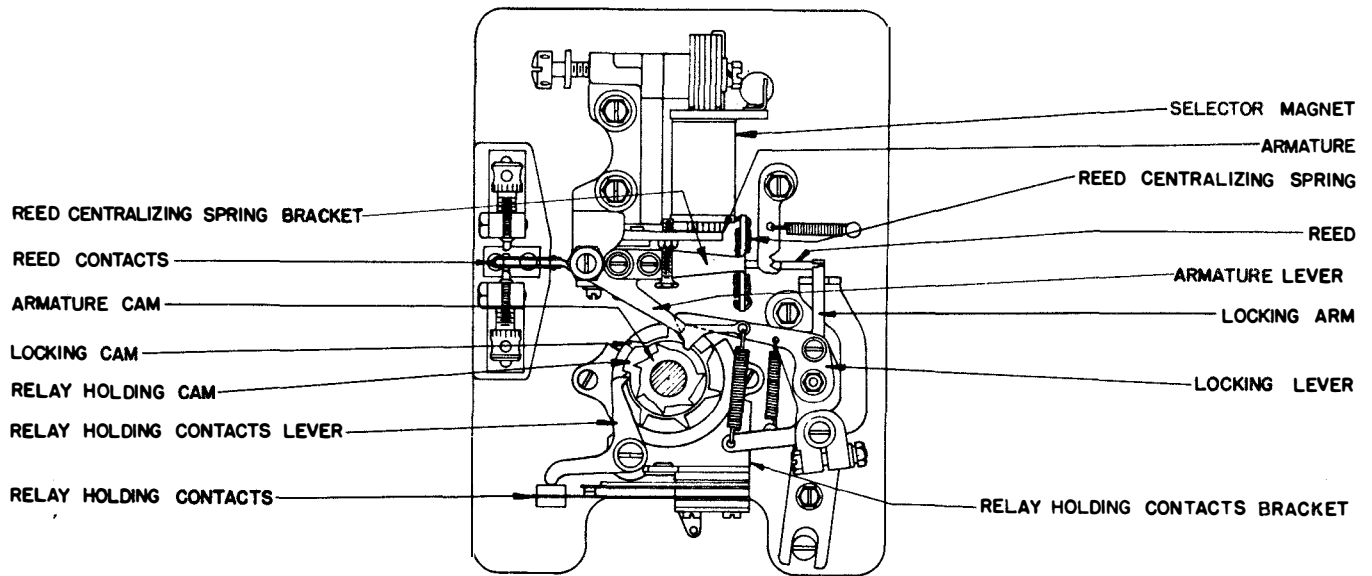


FIGURE 3

ADJUSTMENTS FOR THE START-STOP REGENERATIVE REPEATER

The following adjustments are arranged in a sequence that would be followed if a complete readjustment of the regenerative repeater were undertaken. This fact should be kept in mind when a single adjustment is to be made.

The spring tension values given in this bulletin were derived from measurements made with Teletype spring scales. These scales are calibrated for use in a vertical "pull" position. When used in any other position, the reading is an indicated value. Therefore, in order to obtain the proper spring value readings, the spring scales which are included in the Teletype catalogue tool list should be used.

REGENERATOR UNIT ADJUSTMENTS

Main Shaft End Play Adjustment, (Figure 4)

There should be some clearance, not more than .006" between the faces of the main shaft gear hub and the main shaft aligning nut.

To adjust, position the main shaft gear hub by means of its mounting screw.

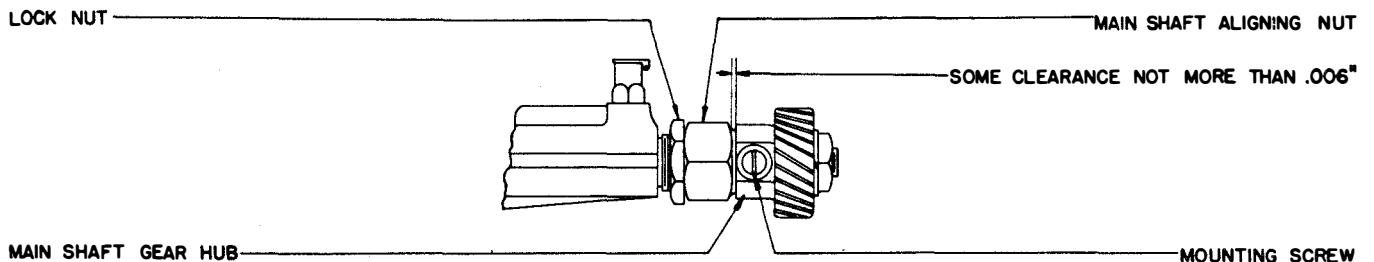


FIGURE 4

NOTE: After making a single adjustment, check related adjustments.

Main Shaft Alignment

The locking lever should ride in the middle of the locking cam.

To obtain this requirement, adjust the main shaft aligning nut by means of its lock nut (See Figure 4 for location of parts).

Pivot Screws Adjustment

The armature lever should ride centrally on the armature cam and the reed should be free to move with a minimum amount of end play at the bearings.

To obtain these requirements, proceed as follows: Adjust the pivot screws so that the armature lever rides centrally on its cam, and tighten the rear lock nut. Then adjust the front pivot screw so that the reed is free to move with a minimum amount of end play at the bearings (See Figure 5 for location of parts).

Selector Magnet Adjustment (Figure 5)

The selector magnet should be positioned on its mounting bracket so that the crest of the armature curve makes contact with the selector magnet core at the middle of both pole faces when the armature is held in the attracted position. This adjustment may be visually checked by examining for clearance on each side of the armature crest against a light background.

Adjust by means of the selector magnet mounting screws.

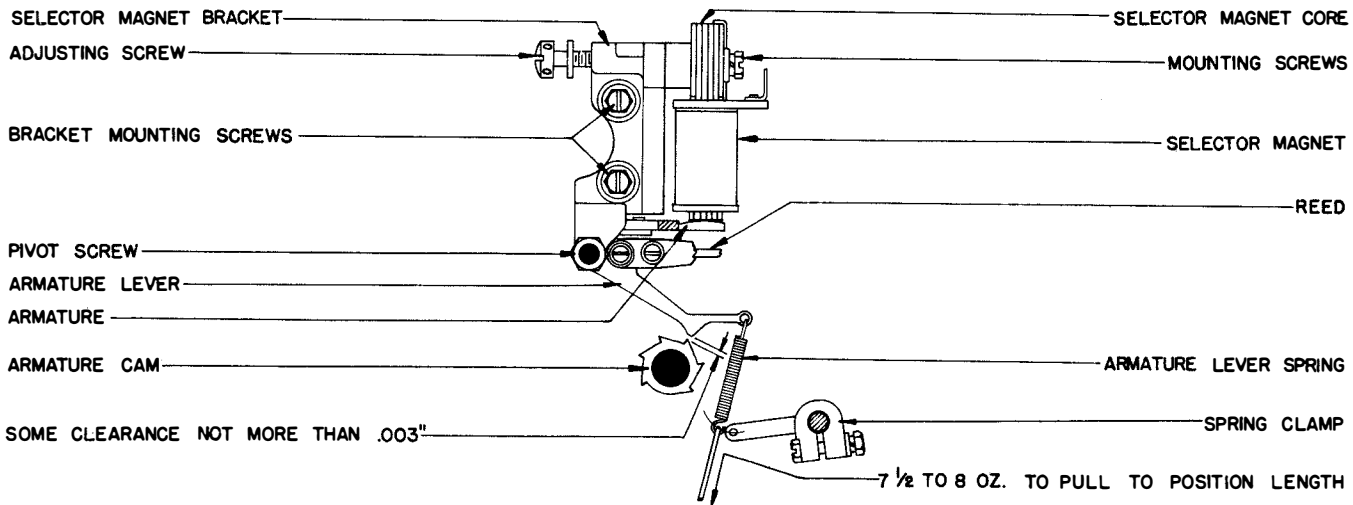


FIGURE 5

Selector Magnet Bracket Adjustment (Figure 5)

With the armature attracted, there should be some clearance, not more than .003", between the armature lever and all peaks of the armature cam.

To make this adjustment, loosen the two bracket mounting screws sufficiently to make the selector magnet bracket friction tight, and adjust the position of the bracket by means of its adjusting screw.

Armature Lever Spring Tension Adjustment (Figure 5)

With the armature lever resting on a high point of the armature cam, unhook the armature lever spring at the spring clamp and hook an 8 oz. scale in the spring eye. It should require from 7-1/2 to 8 ozs. to pull the spring to its position length with the spring parallel to the face plate.

NOTE: After making a single adjustment, check related adjustments.

Adjust the position of the spring clamp by means of its clamping screw to obtain these requirements.

Locking Arm Pivot Bracket Adjustment (Figure 6)

Turn the cam assembly backwards until any one of the locking cam peaks, with the exception of the start-stop impulse peak, is against the locking lever. Under this condition, there should be a clearance of .060" to .065" between the trailing face of the armature lever projection and a trailing face of the armature cam peak.

To adjust, loosen the two locking arm pivot bracket mounting screws, and position the bracket by means of the pivot bracket eccentric screw and lock nut.

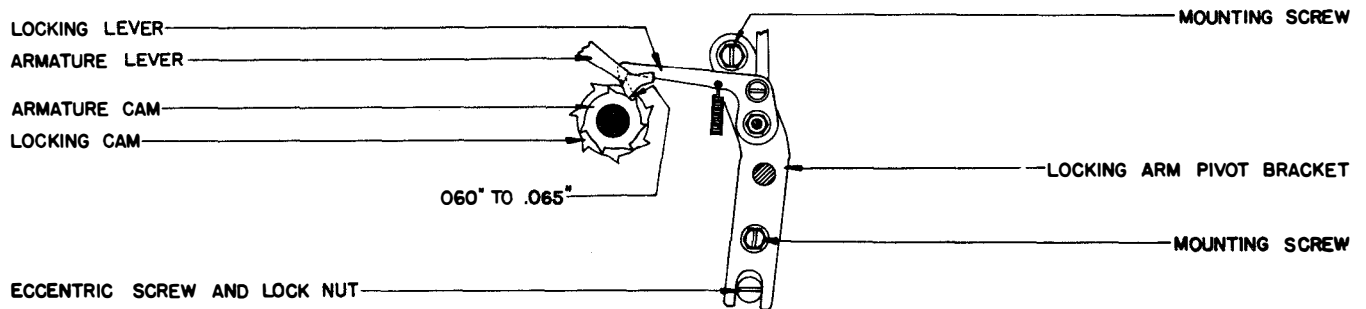


FIGURE 6

Locking Arm Adjustment (Figure 7)

With the locking lever on a peak of the locking cam, the locking arm wedge should clear the reed by .002" to .006" when the two are in line. Check each peak of the locking cam.

To adjust, position the locking arm by means of its clamping screw.

Locking Arm Stop Adjustment (Figure 7)

With the locking lever on a peak of the locking cam, there should be some clearance, not more than .004", between the locking arm's right edge and the locking arm stop.

To adjust, loosen the locking arm stop clamping screw lock nut, and position the locking arm stop. Hold the locking arm stop against the locking arm pivot bracket while making this adjustment.

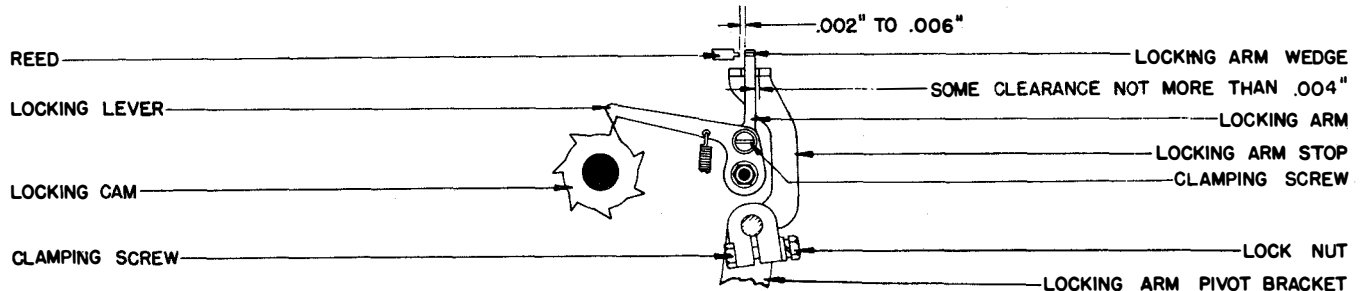


FIGURE 7

NOTE: After making a single adjustment, check related adjustments.

Locking Lever Spring Tension

With the locking lever in a notch of the locking cam, unhook the locking lever spring from its spring post and hook a 32 oz. scale in the spring eye. With the scale held in a horizontal position, it should require from 7 to 8-1/2 ozs. to stretch the spring to position length.

Contact Screw Brackets Adjustment

The upper and lower contact brackets should be positioned so that the contact screws are in line with each other and parallel to the edge of the mounting plate.

Adjust by means of the terminal mounting screws.

Reed Contact Springs Adjustment

The reed contacts should line up centrally with the screw contacts.

To adjust, position the reed contact springs assembly by means of their mounting screws.

Contact Screws Adjustment

With the reed locked in its upper (marking) position, there should be from .003" to .005" clearance between the lower contact screws and the reed contacts. With the reed locked in its lower (spacing) position, check for this same clearance between the upper contact screws and the reed contacts.

To adjust, proceed as follows: Remove the reed centralizing springs and reed detent. Loosen the clamping screws and back off the four contact screws away from the reed contacts.

Lock the reed in the upper (marking) position, and hold the reed against the locking arm by hand. Connect a test lamp to the lower (marking) and middle terminals. Tighten the clamping screws just enough to make the contact screws friction tight. Turn the lower front contact screw until contact is just made. Connect a test lamp to the upper (spacing) and middle terminals. Lock the reed in the lower (spacing) position, and hold it against the locking arm by hand. Turn the upper front contact screw until contact is just made.

Connect the test lamp to the upper and lower terminals, and manually hold the locking arm in the unlock position. Then turn the upper and lower front contact screws toward each other an equal number of divisions, using the slots in the contact brackets for reference, until contact is made through the test circuit. Back off each contact screw two divisions.

Connect test lamp wires to upper and lower terminals. Holding the locking arm in the unlock position, turn the rear upper contact screw until contact is made through the test circuit; then back off the screw four divisions and tighten upper clamping screw. Turn the rear lower contact screw until contact is made through the test circuit; then back off the screw four divisions. Tighten the lower clamping screw. Replace the reed centralizing springs.

Reed Centralizing Spring Bracket Adjustment (Figure 8)

With the reed detent removed, the reed should overtravel the locking arm wedge by an equal amount when the reed is moved to the marking and spacing positions by the manual movement of the armature.

To adjust, position the reed centralizing spring bracket on the armature lever by means of its mounting screws, using the right-hand mounting screw as a pivot.

Replace the reed detent and adjust according to its adjustment on page 7.

NOTE: After making a single adjustment, check related adjustments.

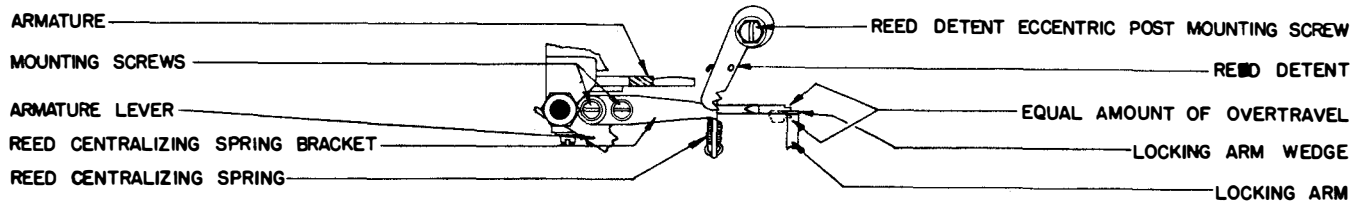


FIGURE 8

Upper Reed Centralizing Spring Tension

With the armature lever on the high part of its cam and the reed locked in the lower (spacing) position, unhook the upper reed centralizing spring from its upper spring hole and hook a 32 oz. scale in the spring eye. It should require from 9 to 15 ozs. to pull the spring to position length.

Lower Reed Centralizing Spring Tension

With the armature lever on the low part of its cam and the reed locked in the upper (marking) position, unhook the lower reed centralizing spring from its lower spring hole and hook a 32 oz. scale in the spring eye. It should require from 9 to 15 ozs. to pull the spring to position length.

Reed Detent Adjustment

With the reed detent bearing against the reed, the clearance between the reed and the locking arm wedge should be equal when the reed is in either the marking or spacing position.

To adjust, position the reed detent eccentric post by means of its mounting screw (See Figure 8 for location of parts).

Reed Detent Spring Tension

With the reed locked in either its marking or spacing position and the reed detent bearing against the reed, unhook the reed detent spring at the spring post and hook an 8 oz. scale in the spring eye. With the scale held in a horizontal position, it should require from 1-3/4 to 2-1/4 ozs. to pull the spring to position length.

Relay Holding Contact Assembly Adjustments (Figure 9)

(a) The bakelite tip on the lower contact spring should exert sufficient pressure on the contact lever to hold it against the high point of the holding contact cam.

Adjust by bending the lower contact spring (See Figure 9-A).

(b) There should be a gap of from .015" to .020" between the upper and lower contact points, and the stiffeners should lie flat against the contact springs and be in contact with them over the entire surface.

Adjust by bending the two upper contact springs and their stiffeners.

(c) With the contact lever on the low part of the relay holding cam (See Figure 9-B), hook an 8 oz. scale on the lower contact spring between the bakelite tip and the contacts. It should require from 1-1/2 to 2 ozs. to just open the contacts when the scale is pulled at right angles to the lower contact spring.

Adjust by bending the lower contact spring.

NOTE: After making a single adjustment, check related adjustments.

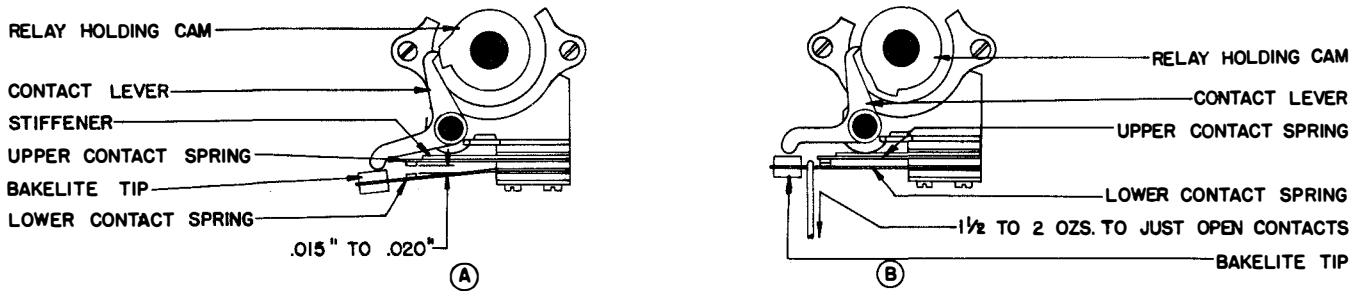


FIGURE 9

Stop Lever Eccentric Screw Adjustment (Figure 10) - See Note A

Remove range finder assembly. The stop lever on the range finder assembly should overtravel the latching surface of the trip latch by .004" to .006".

Adjust the stop lever eccentric screw to obtain this overtravel, making certain that the tightening of the eccentric screw lock nut does not disturb the adjustment.

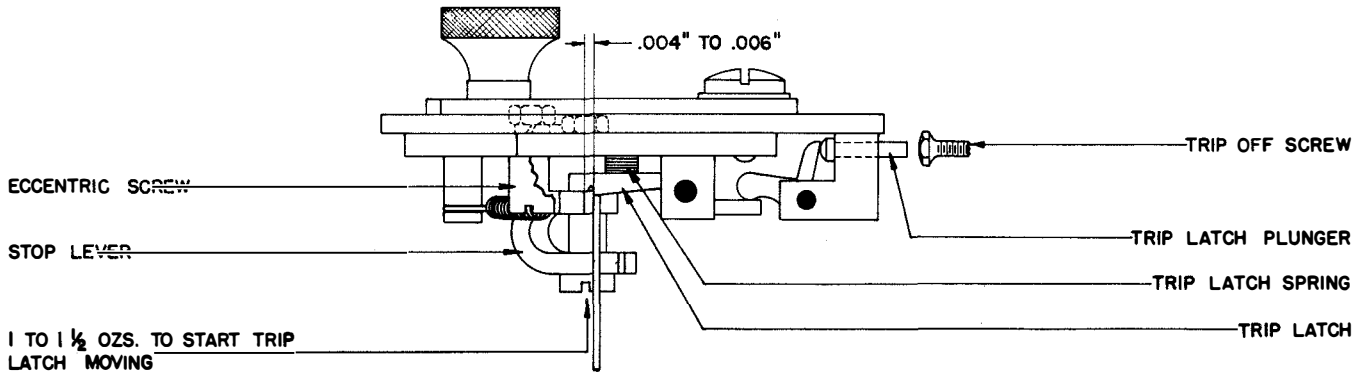


FIGURE 10

Stop Lever Spring Tension (Figure 11) - See Note A

With the trip latch plunger held operated, hook an 8 oz. scale on the end of the stop lever on the range finder assembly. It should require from 3/4 to 1-1/4 ozs. to start the lever moving.

NOTE: Be sure that the stop lever eccentric screw has been adjusted before taking this reading.

Trip Latch Spring Compression (Figure 10) - See Note A

When measuring this requirement, the range finder assembly should be held in a horizontal position. An 8 oz. scale should be held in a vertical position and applied to the step of the trip latch. It should require from 1 to 1-1/2 ozs. when pushing upward to start the trip latch moving.

Replace the range finder assembly. Care should be taken that the trip latch plunger does not jam against the trip-off screw when re-mounting.

(A) The range finder should be removed to check these requirements.

NOTE: After making a single adjustment, check related adjustments.

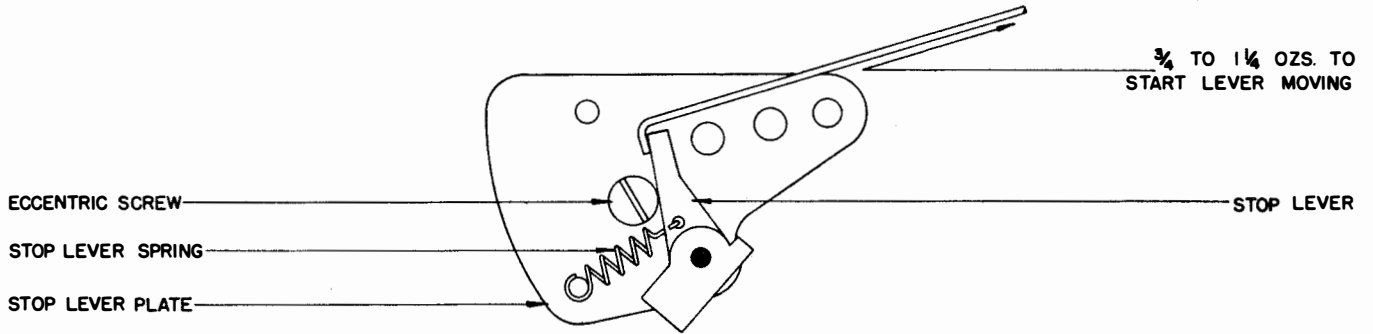


FIGURE 11

Trip-Off Screw Adjustment (Figure 12)

When the armature lever is on the low part of the armature cam, the stop lever, on the range finder, should clear the trip latch by .005" to .010".

Adjust the trip-off screw by means of its lock nut to obtain this clearance.

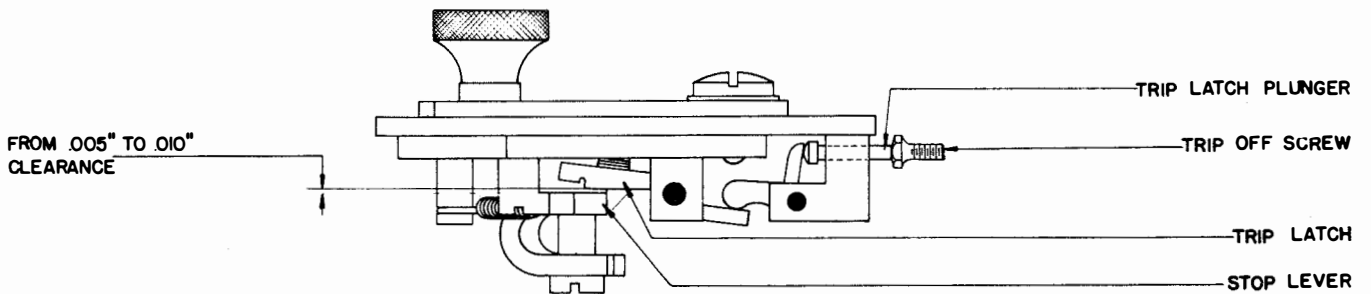


FIGURE 12

Friction Clutch Torque (Figure 13)

With the motor running at least 10 minutes, hook a 32 oz. scale to the cam sleeve stop arm. It should require a tangential pull of 14 to 18 ozs. to hold the sleeve stationary.

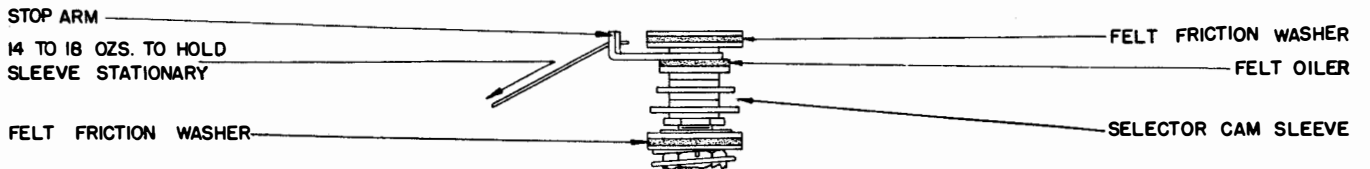


FIGURE 13

REGENERATOR PANEL ADJUSTMENTS

Counter Shaft Alignment

The motor gear on the counter shaft should line up with the motor pinion.

NOTE: After making a single adjustment, check related adjustments.

To adjust, loosen the bearing cap screws and position the counter shaft. When the bearing caps and brackets are firmly tightened, make sure there is no bind in the shaft.

Motor Plate Adjustment

There should be a barely perceptible amount of backlash between the motor pinion and the motor gear on the counter shaft, at the point where there is the least amount of backlash in one complete revolution of the counter shaft.

To adjust, loosen the two upper mounting screws about 1/4 turn and back off the lower motor plate mounting screw. Loosen the lock nut on the motor plate adjusting screw, and adjust the position of the motor. Tighten the three motor plate mounting screws and the adjusting screw lock nut. Recheck the backlash between the motor pinion and the motor gear on the counter shaft.

Motor Unit Slip Connection Springs Adjustment

- (a) Mount the motor unit in position on the regenerator panel. Hook a 12 lb. scale under one of the end motor unit slip connection springs, just in back of the terminal screw on the motor connection block, and pull upward at right angles to the spring. It should require from 2 to 4 lbs. to just break contact. Take the pressure of the other end slip connection spring in the same manner. This requirement may be obtained by removing the motor unit and bending the springs.
- (b) Remove the motor unit, and place a straight edge across the two end springs. Then bend the two inner springs, so that the clearance between the inner springs is perceptible, but not more than .015".

Regenerator Unit Mounting

Mount the regenerator unit on the front of the regenerator panel with two lower mounting screws. Tighten the screws securely. From the back of the panel engage the upper mounting screw in the regenerator unit mounting hole. Adjust the play between the regenerator unit gear and the counter shaft gear by means of the adjusting bushing so that there will be a very slight backlash in the gears. Tighten the mounting screw and recheck gear play.

Orientation

Mounted in front of the horizontal main shaft of the regenerator unit, is the range finder assembly, used for the purpose of orientating the regenerator unit to the incoming signals.

In order to take an orientation range, the receiving side of the regenerator unit should be connected to the receiving circuit, and a monitoring printer should be connected to the transmitting side of the regenerator unit. Now "RY" should be transmitted through the regenerator unit, to the monitoring printer (the letters "R" and "Y" sent alternately) continually while the range is being taken.

While "RY" is being received, loosen the thumb screw and shift the range finder toward "zero" until errors begin to appear in the "RY". Then move it back slowly until these errors disappear. This position indicates one limit of the orientation range.

Repeat the same performance toward the opposite end of the scale to find the other limit.

After the two limits (or extreme positions of perfect printing) have been found, the range finder should be set midway between these two points.

LUBRICATION SPECIFICATION

The oil and grease specified in the supplement furnished with this bulletin should be used to lubricate the start-stop regenerative repeater.

NOTE: After making a single adjustment, check related adjustments.

In applying this specification to the lubrication of regenerator units, it is important to guard against the use of excessive amounts of oil or grease. Excess oil spreads and may get into the contacts, causing damage due to arcing, while the presence of oil on insulators may cause leakage across them. Therefore, it is important that any which tends to spread along the sending contacts, the relay holding contacts, or their insulators, should be wiped off. The magnet pole faces and armature should also be free of oil.

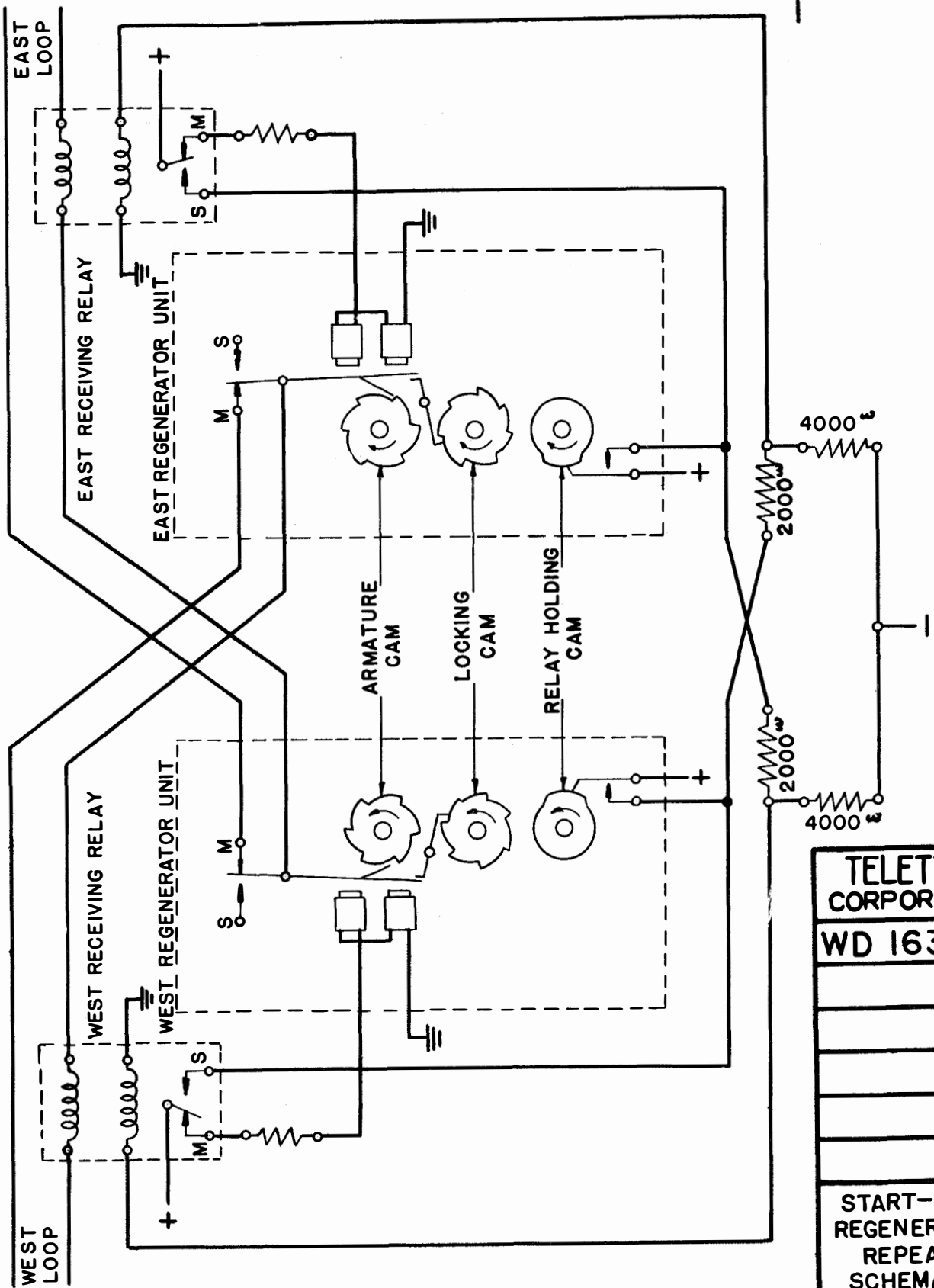
Unless otherwise specified, one or two drops of oil at each of the places indicated will be sufficient. Use oil for lubrication at all of the places listed in the following, except where the use of grease is specified.

A. Regenerator Unit

1. Armature lever and reed pivots - oil front and rear pivot screws at the armature lever pivot and reed pivot.
2. Cam sleeve - each cam peak.
3. Cam sleeve felt oilers - saturate and wipe off excess oil.
4. Friction clutch felt washers - pry the front and rear steel discs apart with screw driver and saturate felt washers with oil. The rear steel discs can be separated by inserting the screw driver in the cut-away space provided.
5. Lever bearings - a drop of oil at the locking lever, reed detent, and relay holding contact lever bearings.
6. Locking arm wedge and reed - engaging surfaces.
7. Main shaft bracket - six drops of oil in each cup.
8. Main shaft thrust bearing - between the faces of the main shaft gear hub and the main shaft aligning nut.
9. Range finder - trip latch, trip latch bell crank, trip latch plunger, two bearings on the stop lever. Both ends of the stop lever spring.
10. Reed detent - points of contact between the reed detent and the reed.
11. Relay holding contact bracket - between the friction plate and spacer plate at two diametrically opposite places.
12. Spring holes and posts - a drop of oil at each of the seven spring holes and two spring posts.
13. Spring wicks - saturate the five spring oil wicks and wipe off excess oil.
14. Trip-off screw - point of contact between trip-off screw and trip latch plunger.

B. Regenerator Panel

1. Counter shaft ball bearing - two drops of oil at both bearings.
2. Gears - apply grease to ten gears on the rear of the panel and remove excess grease.
3. Motor bearings - two ball oilers. Use grease according to the instructions contained in the supplement furnished with this bulletin, or one drop of oil in each ball oiler.



TELETYPE CORPORATION
WD 1638
START-STOP REGENERATIVE REPEATER SCHEMATIC CIRCUIT
DRAWN R.M.C. TRACED H.J.K. CHECKED S.J. ENGR'D H.W.H. APPROVED <i>[Signature]</i>

CHANGES IN BULLETIN 155 (ISSUE 1)
DESCRIPTION AND ADJUSTMENTS OF THE
START-STOP REGENERATIVE REPEATER

*PAGE 4

Delete the "SELECTOR MAGNET POSITION" adjustment found in EE-423, Issue 1 and restore the "SELECTOR MAGNET ADJUSTMENT" found in the bulletin.

SELECTOR MAGNET BRACKET ADJUSTMENT (Figure 5)

Change this adjustment to read as follows:

With the armature in its attracted position, there should be some clearance, not more than .002", between the armature lever and the highest peak of the armature cam. To adjust, loosen the two bracket mounting screws sufficiently to make the selector magnet bracket friction tight, and adjust the position of the bracket by means of its adjusting screw.

ARMATURE LEVER SPRING TENSION ADJUSTMENT (Figure 5)

Change the adjusting procedure as follows:

To adjust, loosen the spring clamp clamping screw and position the clamp. When tightening the screw make sure that the spring is parallel to the face plate.

PAGE 6

Add the following adjustment after LOCKING LEVER SPRING TENSION:

PIGTAIL CONTACT CONNECTION

Make certain that the pigtail contact connections are spiraled, securely fastened at both ends, without loose strands and located approximately midway between the sending contact brackets.

PAGE 7

RELAY HOLDING CONTACT ASSEMBLY ADJUSTMENTS (Figure 9)

Change the requirement in (b) to read .010" to .020" instead of .015" to .020".

Add the following note at the beginning of paragraph (c):

NOTE: Before making this adjustment make certain that there is some clearance between the bakelite tip on the lower long contact spring and the contact lever when the contact lever is held against the low part of the relay holding cam.

PAGE 11

Change item 12 to specify grease instead of a drop of oil at each of the seven spring holes and two spring posts.

* * *

*Indicates change

CHANGE IN BULLETIN 155 (ISSUE 1)
DESCRIPTION AND ADJUSTMENTS OF THE
START-STOP REGENERATIVE REPEATER

Page 6

Contact Screws Adjustment

Change first paragraph to read as follows: With the reed locked in its upper (marking) position, there should be a .003" to .005" clearance between the upper contact screws and the reed contacts. With the reed locked in its lower (spacing) position, make sure that this same clearance exists between the lower contact screws and the reed contacts.

* * *

CHANGE IN
BULLETIN 155 (ISSUE 1)
DESCRIPTION AND ADJUSTMENTS
OF THE
START-STOP REGENERATIVE REPEATER

PAGE 9

TRIP-OFF SCREW ADJUSTMENT (Figure 12)

Change this adjustment to read as follows:

Position the pointer of the range finder between 90 and 100. With the armature held in MARKING position, rotate the selector cam sleeve until the reed is in its MARKING position and until the rotation is stopped by the stop arm engaging the stop lever on the range finder. Release the armature and rotate the cam sleeve until the engaging surface of the stop lever just overlaps the engaging edge of the trip latch. The stop lever should clear the trip latch by .005" to .010". To adjust, loosen the trip-off screw lock nut and position the trip-off screw; tighten the lock nut.

* * *

CHANGES IN
BULLETIN 147 (ISSUE 2) ADJUSTMENTS OF THE
NONTYPING REPERFORATOR (MODEL 14 AND 20)
AND BULLETIN 155 (ISSUE 1)
DESCRIPTION AND ADJUSTMENTS
OF THE START-STOP REGENERATIVE REPEATER

Page 6, Bulletin 147
Page 8, Bulletin 155

STOP LEVER ECCENTRIC SCREW ADJUSTMENT

Change the first sentence of this adjustment to read as follows:

"The stop lever on the range finder assembly should overtravel the latching surface of the trip latch by some clearance, not more than .006".

* * *

ADDITION TO
BULLETIN 155, ISSUE 1
DESCRIPTION AND ADJUSTMENTS
OF THE START-STOP REGENERATIVE REPEATER

In order to improve lubrication of the 90007 shaft of the regenerative repeater a felt oil ring 89096 has been applied to the shaft assembly over the space between 90014 gear hub and the 90006 shaft aligning nut.

PAGE 11

Add the following to Item 8 under "REGENERATOR UNIT":

"Saturate the felt oil ring."

ADDITION TO ADJUSTMENT BULLETINS

- Bulletin 127, Issue 3 - Type Bar Tape Printer (Model 14), Pages 7, 13
- Bulletin 138, Issue 5 - Type Bar Page Printer (Model 15), Pages 21, 26
- Bulletin 147, Issue 2 - Single Magnet Reperforator, Page 6
- Bulletin 155, Issue 1 - Start-Stop Regenerative Repeater, Page 8
- Bulletin 159, Issue 2 - Type Wheel Page Printer (Model 26), Page 6
- Bulletin 160, Issue 1 - Type Bar Page Printer (Model 20), Page 16
- Bulletin 165, Issue 3 - Typing Reperforator (Model 14), Pages 2-5, 2-8
- Bulletin 171, Issue 2 - Typing Reperforator, Page 7
- Bulletin 178, Issue 1 - Reperforator Transmitter Distributor, Page 9
- oes Bulletin 182, Issue 1 - Multiplex Start-Stop Extensor Set, Page 17
- oes Bulletin 193, Issue 1 - Reperforator Transmitter Distributor (Model 14), Page 8
- Bulletin 197, Issue 1 - Multiple Reperforator Set, Page 16
- Bulletin 198, Issue 1 - Type-Wheel Page Printer (Model 27), Page 18
- Bulletin 199, Issue 1 - Simplex-Diplex Converter, Page 2-4
- oes Bulletin 201, Issue 1 - Sequential Control (SECO) System, Page 5-5
- Bulletin 203, Issue 1 - Reperforator Transmitter (Model 14), Page 2-5
- oes Bulletin 204, Issue 1 - Sequential Selector (SOTUS), Page 3-6

The following adjustment applies to units equipped with the Adjustable Range Scale Assembly which permits regulation of the engagement between the stop arm on the selector cam sleeve and the stop lever on the range finder. The adjustment should be made immediately after the STOP LEVER SPRING TENSION ADJUSTMENT; bulletins and affected pages are listed above.

SELECTOR STOP ARM AND STOP LEVER ENGAGEMENT ADJUSTMENT

With the selector magnet armature in the spacing position, rotate the selector cam sleeve until the stop arm moves the stop lever to its maximum travel beyond the step of the trip latch. Loosen the range scale assembly mounting screws and the positioning link mounting screw just enough to make them friction tight. Position the range scale assembly so that the overtravel of the stop lever beyond the trip latch is at least half but not more than the width of the stop lever. This should be checked with the range indicator set at 0, 60, and 120 on the range scale. Tighten the mounting screws and the positioning link screw.

* * *

ADDITIONS TO BULLETINS

- 127, Issue 3, Adjustments - Model 14 Printer, Page 23
- 138, Issue 5, Adjustments - Typebar Page Printer (Model 15), Page 46
- 147, Issue 2, Adjustments - Non-Typing Reperforator, Page 8
- 155, Issue 1, Description and Adjustments - Start-Stop Regenerative Repeater, Page 9
- 159, Issue 2, Adjustments - Type Wheel Page Printer (Model 26), Page 29
- 160, Issue 1, Adjustments - Typebar Page Printer (Model 20), Page 34
- 165, Issue 3, Adjustments - Typing Reperforator (Model 14), Page 2-18
- 171, Issue 2, Adjustments - Typing Reperforator (Model 14), Page 21
- 178, Issue 1, Adjustments - Reperforator Transmitter (Model 14), Page 49
- 193, Issue 1, Adjustments - Model 14 Reperforator Transmitter, Page 35
- 201, Issue 1, Teletype Sequential Control (SECO) System, Page 5-8
- 203, Issue 1, Adjustments - Reperforator Transmitter (Model 14), Page 2-25
- 204, Issue 1, Description and Adjustments - Sequential Selector, Page 3-9
- *197, Issue 1, Adjustments - Multiple Reperforator Set, Page 24

1. This correction sheet supersedes EE-661 dated August, 1949, and applies to all bulletins listed above.

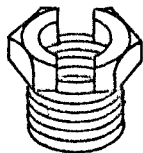
2. Add the information contained in paragraphs 3 and 4 below to the SELECTOR CLUTCH TORQUE requirement.

3. A more convenient method of regulating the selector clutch torque has been devised by the substitution of a 119540 keyed nut, a 122974 capstan nut, and a 122838 spacer for the 72515 nut and 72517 keyed nut on the main shaft. Where these new parts are present, the torque may be regulated by positioning the capstan nut in the proper direction with a screwdriver.

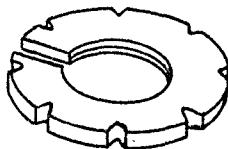
NOTE: The 122974 capstan nut is split and the open ends are offset to insure a tight fit on the 119540 slotted nut. To install the capstan nut the offset ends must be held approximately in line by using a pair of pliers or a clamp. The slotted nut can then be screwed into place. To regulate the selector torque the capstan nut may be positioned with a screwdriver. To prevent the capstan nut from being turned downward against the bearing, the 122838 spacer should be installed between the 119540 slotted nut and the bearing.

4. On units equipped with the 72515 nut and 72517 keyed nut, the selector clutch torque may be adjusted by the use of shims which may be placed between the clutch spring and the 72515 nut. The selector clutch spring must be removed from the shaft in order to apply the shims. Shims are available under the following numbers:

- 96763 Shim (.012" thick)
- 96764 Shim (.016" thick)
- 96765 Shim (.020" thick)



119540 NUT, KEYED



122974 NUT, CAPSTAN



122838 SPACER

CHANGES IN LUBRICATION SPECIFICATIONS
WHICH APPLY TO ALL TELETYPE APPARATUS

The following lubricants have been standardized for use on all types of Teletype apparatus. These lubricants supersede those referred to in preceding Teletype specifications. The lubricants can be ordered from Teletype as follows:

88970	1 Qt. of KS-7470 Oil
88971	1 Gal. of KS-7470 Oil
88973	1 Lb. of KS-7471 Grease
*88975	KS-8319 Grease Gun
97116	4-oz. Tube of KS-7471 Grease

The above grease is recommended instead of oil for lubricating motors equipped with ball bearing. The 88975 grease gun should be used for injecting grease into the bearings of Teletype ball bearing motors. The gun may be used also for applying grease to other parts of the apparatus and no other grease container need be carried. If this grease gun is not available, the oil listed in the foregoing should be substituted for lubricating ball bearing motors.

* Instructions for Filling the Grease Gun

1. Unscrew the lubricant tube from the cap casting of the grease gun.
2. Insert fresh lubricant through the open end of the tube with the fingers. Apply gradually to eliminate air pockets.
3. Tamp the lubricant down solidly in the tube by pounding the closed end solidly against the palm of the hand. Continue to add lubricant until the tube is completely filled and the metal follower rests against the perforated tube cover.
4. Fill the cap casting with lubricant flush to the bottom side of the tube threads.
5. Screw the lubricant tube into the cap casting part way only. Then insert a pencil or rod through the perforated tube cover and exert pressure against the metal follower so as to expel any entrapped air past the tube threads. When lubricant begins to ooze through the threads, tighten the lubricant tube securely in the cap casting.
6. Operate the handle back and forth for several strokes or until lubricant is pumped from the nozzle. The gun is then ready for use. If the lubricant does not flow from the nozzle in a solid stream, it is an indication that all air has not been expelled from the lubricant tube. Invert the gun and pound the cap casting end against the palm of the hand to jar the lubricant into the pump cylinder.

* Instructions for Lubricating Motor Ball Bearings

The motor bearings are packed with grease before the motor leaves the factory and under ordinary operating conditions need no additional lubrication for

* Indicates change

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approximately two months. At the regular lubricating intervals one or two strokes of the plunger of the gun should apply sufficient grease to each bearing. To lubricate, press the nozzle of the gun against the ball oiler and force the grease into the hole by pushing on the plunger of the gun. Care should be taken that the bearings are not overloaded. Overloading will result in the grease oozing out of the end castings and being forced into the motor or being thrown on other parts of the mechanism. After lubricating, the motor should be run for a few minutes and then any excess grease that has been forced out of the ends of the castings should be wiped off. Each time that the gun is used for lubricating a motor bearing, the plunger should first be depressed slightly to make sure that grease will be delivered.