28 TRANSMITTER-DISTRIBUTOR BASE

ANSWER-BACK MECHANISM

REQUIREMENTS AND ADJUSTMENTS

CONTENTS PAGE

1. GENERAL

1.01 This section contains the requirements and adjustments for a 28 transmitter-distributor base equipped with the answer-back mechanism. This section and the general teletypewriter requirements and adjustments section provide the complete adjusting information for this unit. This section also describes how to code the message drum.

1.02 This section is reissued to make changes in the coding of the answer-back assembly and to include the latest adjusting requirements.

1.03 Where a requirement calls for the clutch to be disengaged, the clutch shoe lever must be fully latched between its triplever 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.

Note: When the shaft is rotated by hand, the clutch does not fully disengage upon reaching its stop position. 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 disc with a screwdriver to cause it to engage its latch lever and thus disengage the internal-expansion clutch shoes from dragging on the clutch drum.

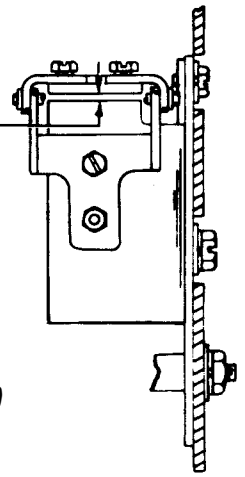
2. REQUIREMENTS AND ADJUSTMENTS

2.01 Clutch Triplever and Armature Mechanism

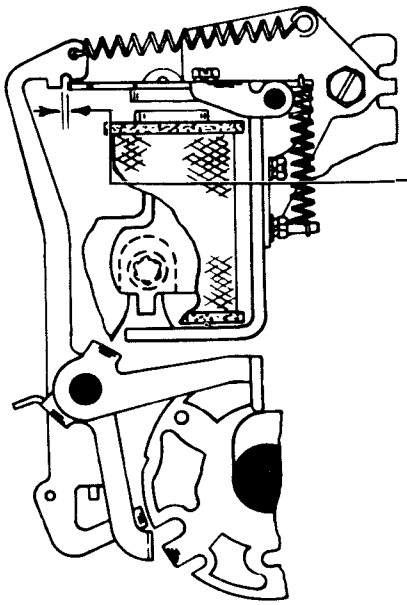
CLUTCH TRIP ARMATURE AIR GAP (PRELIMINARY)

REQUIREMENT
AIR GAP BETWEEN ARMATURE AND MAGNET ASSEMBLY BRACKET:
MIN. 0.004 INCH --- MAX. 0.008 INCH
WHEN ARMATURE IS HELD FLUSH AGAINST MAGNET CORE.

TO ADJUST
REMOVE ARMATURE EXTENSION SPRING. LOOSEN SPRING POST AND HINGE MOUNTING SCREW AND POSITION HINGE.



NOTE: ONE SIDE OF THE ARMATURE CONTAINS A HEAVY CHROME PLATING STAMPED "C". THE "C" SIDE SHOULD FACE THE MAGNET CORE. (DC OPERATION)



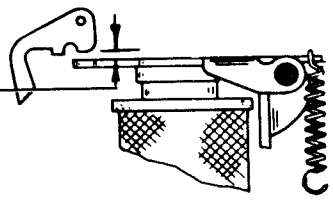
CLUTCH TRIPLEVER

REQUIREMENT
CLEARANCE BETWEEN ARMATURE EXTENSION LEVER AND LATCHING SURFACES OF CLUTCH TRIPLEVER
MIN. 0.020 INCH --- MAX. 0.030 INCH
WHEN CLUTCH TRIPLEVER ON HIGH PART OF CAM.

TO ADJUST
LOOSEN PLATE ADJUSTING SCREW AND PLATE MOUNTING SCREW. INSERT SCREWDRIVER IN SLOT ADJACENT TO ADJUSTING SCREW AND POSITION PLATE FOR REQUIRED CLEARANCE.

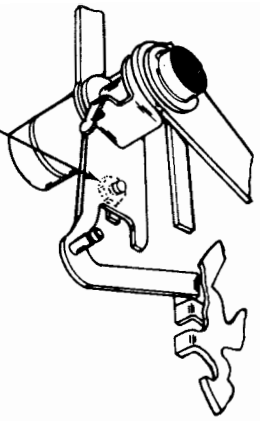
ARMATURE EXTENSION

REQUIREMENT
CLEARANCE BETWEEN ARMATURE EXTENSION LEVER AND CLUTCH TRIPLEVER
MIN. 0.030 INCH --- MAX. 0.040 INCH
WHEN CLUTCH TRIPLEVER IS ON HIGH PART OF CAM AND ARMATURE IS FLUSH AGAINST CORE (PLAY TAKEN UP WITH SPRING).



TO ADJUST
LOOSEN BRACKET MOUNTING SCREW AND BRACKET ADJUSTING SCREW AND INSERT SCREWDRIVER INTO SLOT BELOW ADJUSTING SCREW, AND ADJUST BRACKET.

2.02 Clutch Stop Arm, Clutch Shoe Lever, and Cam Follower Guide

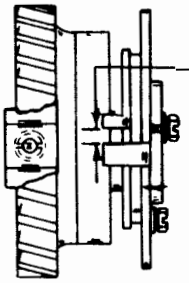


CLUTCH STOP ARM

REQUIREMENT
WITH CLUTCH TRIP LEVER IN LATCHED POSITION, CLUTCH LEVER SHALL FULLY ENGAGE CLUTCH SHOE LEVER.

TO ADJUST
WITH CLUTCH IN STOP POSITION, LOOSEN CLUTCH TRIP CLAMPING SCREW AND ADJUST CLUTCH STOP LEVER TO OBTAIN FULL BITE WITH CLUTCH SHOE LEVER.

NOTE: WHEN ARMATURE IS IN ATTRACTED POSITION, CLUTCH STOP ARM SHOULD CLEAR STOP LEVER AND STOP LUG BY AT LEAST SOME CLEARANCE.

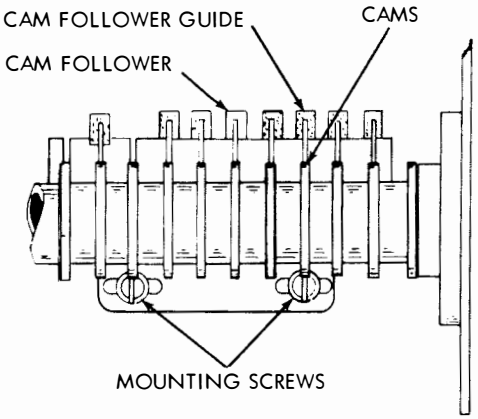


CLUTCH SHOE LEVER

REQUIREMENT
CLEARANCE BETWEEN CLUTCH SHOE LEVER AND EXTENSION
MIN. 0.055 INCH --- MAX. 0.085 INCH
GREATER WHEN CLUTCH IS ENGAGED THAN WHEN DISENGAGED.

TO ADJUST
LOOSEN TWO CLAMP SCREWS IN CLUTCH DISK. ROTATE ADJUSTING DISK TO OBTAIN PROPER CLEARANCE.

NOTE: AFTER ABOVE ADJUSTMENT IS MADE DISENGAGE CLUTCH AND ROTATE DRUM IN NORMAL ROTATION TO MAKE CERTAIN IT DOES NOT DRAG ON SHOES. IF DRUM DRAGS, REFINE ADJUSTMENT.

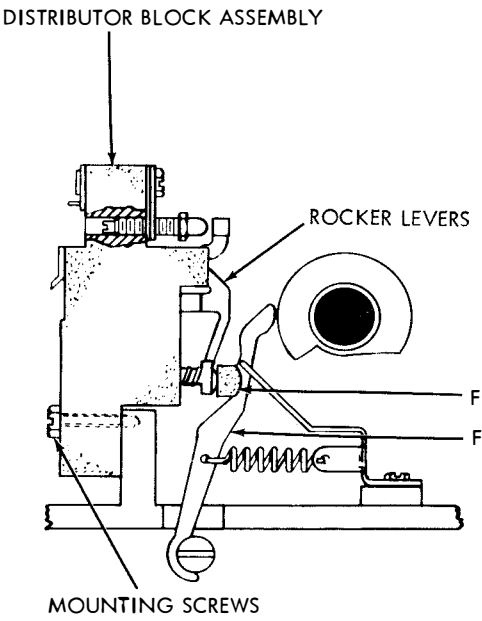


CAM FOLLOWER GUIDE

REQUIREMENT
CAM FOLLOWER GUIDE ORIENTED SO CENTER CAM FOLLOWER IS FULLY ON CAM WHEN FOLLOWER IS MOVED SIDEWAYS IN GUIDE SLOT. OTHERS **MUST** HAVE AT LEAST 75% BITE WHEN MOVED IN EITHER DIRECTION, AND BE FREE IN THEIR GUIDE SLOTS.

TO ADJUST
POSITION CAM FOLLOWER GUIDE WITH ITS MOUNTING SCREWS LOOSENED. AFTER TIGHTENING, CHECK FOR FREENESS.

2. 03 Distributor Block Assembly, Distributor Contact Gap, and Clutch Shoe Lever Spring



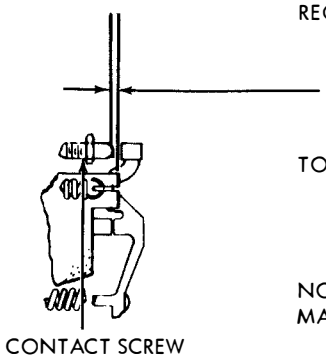
DISTRIBUTOR BLOCK ASSEMBLY

REQUIREMENT

DISTRIBUTOR BLOCK ASSEMBLY POSITIONED ON CASTING SO THAT ROCKER LEVERS ARE FULLY ENGAGED WITH THE BAKELITE ON THE FOLLOWER LEVERS.

TO ADJUST

LOOSEN DISTRIBUTOR BLOCK ASSEMBLY MOUNTING SCREWS AND POSITION BLOCK LEFT OR RIGHT TO OBTAIN REQUIREMENT.



DISTRIBUTOR CONTACT GAP

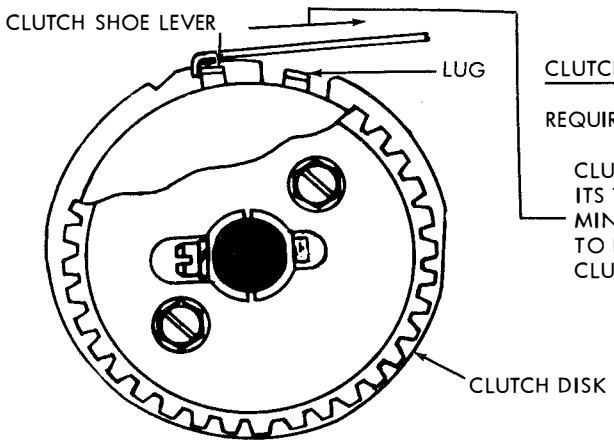
REQUIREMENT

CONTACT GAP
MIN. 0.020 INCH --- MAX. 0.030 INCH
WITH CAM FOLLOWER LEVER ON HIGH PART OF CAM.

TO ADJUST

TURN CONTACT SCREW AT SOCKET END UNTIL DESIRED GAP IS OBTAINED. CHECK ALL CONTACT GAPS.

NOTE: POSITION FOLLOWER ON HIGH PART OF CAM BY TRIPPING CLUTCH MANUALLY AND ROTATING DISTRIBUTOR SHAFT.



CLUTCH SHOE LEVER SPRING

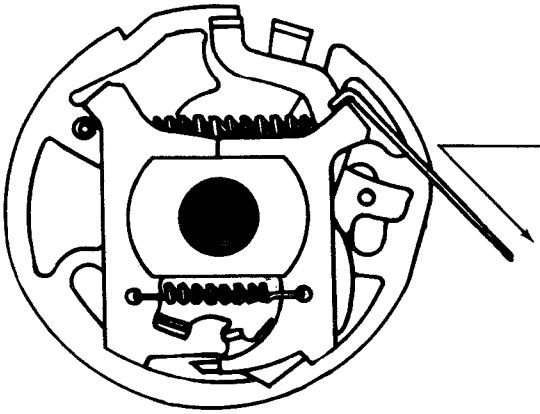
REQUIREMENT

CLUTCH ENGAGED. CLUTCH DISK HELD TO PREVENT ITS TURNING:
MIN. 15 OZS. --- MAX. 20 OZS.
TO PULL SHOE LEVER IN CONTACT WITH LUG ON CLUTCH DISK.

2.04 Clutch Shoe and Distributor Cam Follower Springs

NOTE

AS IT REQUIRES REMOVAL OF CLUTCH FROM SHAFT, THIS SPRING TENSION SHOULD NOT BE CHECKED UNLESS THERE IS GOOD REASON TO SUSPECT THAT IT WILL NOT MEET ITS REQUIREMENT.

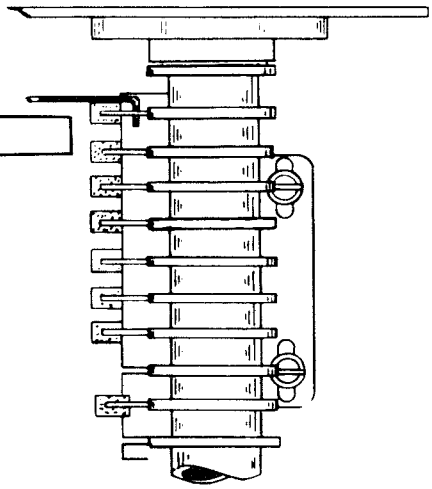


CLUTCH SHOE SPRING

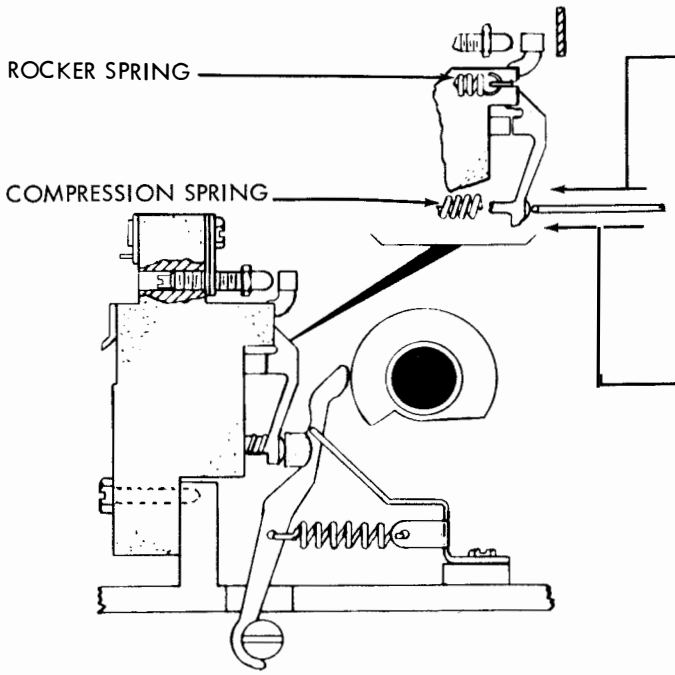
REQUIREMENT
CLUTCH DRUM REMOVED.
MIN. 3 OZS. --- MAX. 5 OZS.
TO START PRIMARY SHOE MOVING AWAY FROM SECONDARY SHOE.

DISTRIBUTOR CAM FOLLOWER SPRING

REQUIREMENT
DISTRIBUTOR BLOCK REMOVED.
MIN. 1/2 OZ. --- MAX. 1-1/2 OZS.
TO START CAM FOLLOWER LEVER MOVING WHEN LEVER IS ON HIGH PART OF CAM.



2. 05 Distributor Rocker and Compression Springs



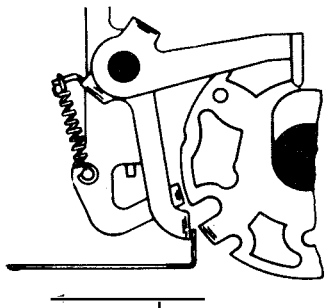
DISTRIBUTOR ROCKER SPRING

REQUIREMENT
WITH COMPRESSION SPRINGS REMOVED AND CONTACTS INITIALLY ADJUSTED SO CONTACT SURFACE IS APPROXIMATELY 1/32 INCH BELOW OUTER SURFACE OF CONTACT BLOCK:
MIN. 3 OZS. --- MAX. 4 OZS.
TO SEPARATE CONTACTS.

DISTRIBUTOR ROCKER COMPRESSION SPRING

REQUIREMENT
WITH COMPRESSION SPRINGS INSTALLED
MIN. 6-1/2 OZS. --- MAX. 9-1/2 OZS.
TO JUST SEPARATE CONTACTS.

2. 06 Clutch Latch Lever, Trip Lever, and Magnet Armature Bail Springs

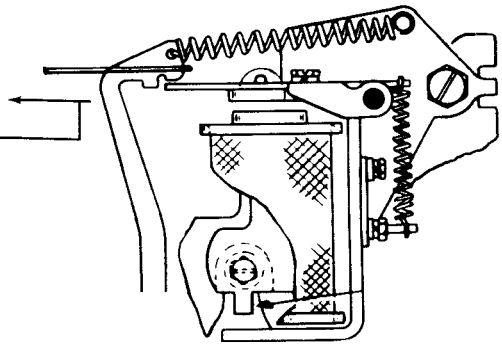


CLUTCH LATCH LEVER SPRING

REQUIREMENT
CLUTCH LATCH LEVER ON LOW OF CLUTCH DISK (BUT NOT LATCHED)
MIN. 2-1/2 OZS. --- MAX. 4-1/2 OZS.
TO START LATCH LEVER MOVING.

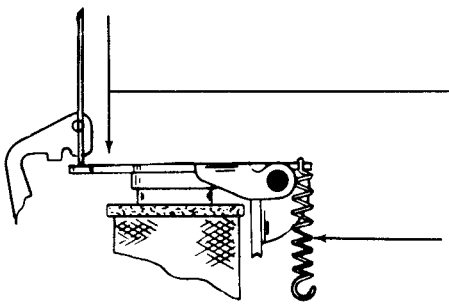
CLUTCH TRIP LEVER SPRING

REQUIREMENT
CLUTCH TRIPPED AND ARMATURE HELD AGAINST MAGNET CORE
MIN. 2 OZS. --- MAX. 3-1/2 OZS.
TO START TRIPLEVER MOVING.



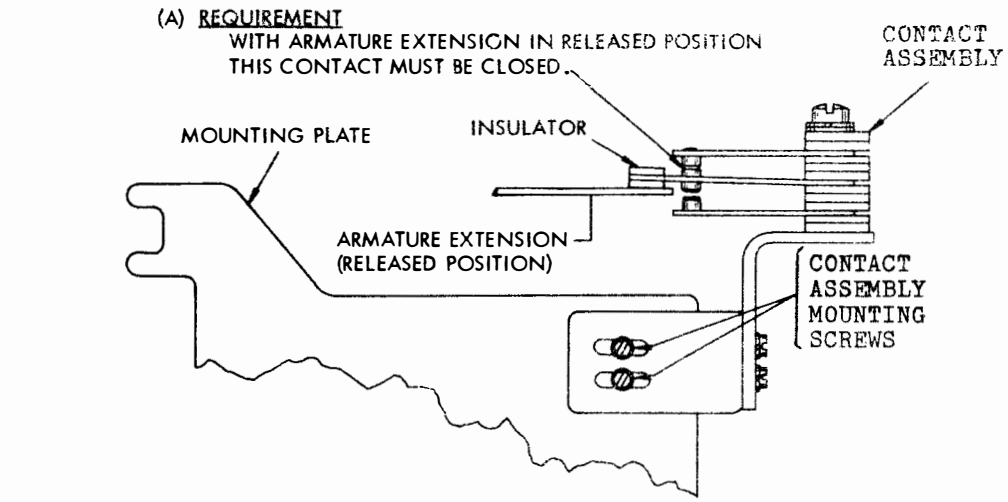
CLUTCH MAGNET ARMATURE BAIL SPRING

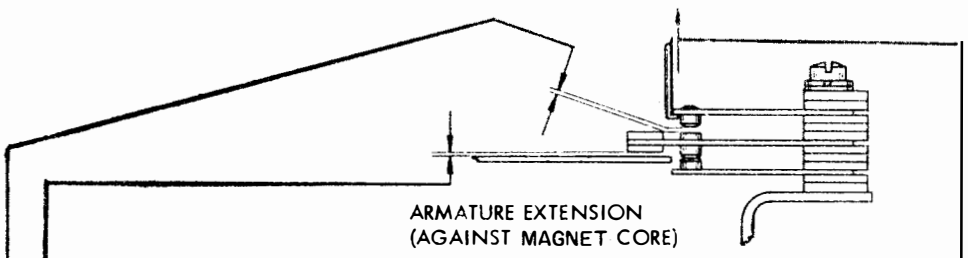
REQUIREMENT
CLUTCH MAGNET TRIPPED AND SHAFT ROTATED MANUALLY UNTIL TRIP FOLLOWER IS ON HIGH PART OF CAM,
AUXILIARY CONTACT SWINGER HELD AWAY FROM EXTENSION LEVER
MIN. 2-1/2 OZS. --- MAX. 4 OZS.
TO START ARMATURE EXTENSION MOVING.



ARMATURE BAIL SPRING

2.07 Auxiliary Contact (TWX)





(B) REQUIREMENT

(1) WITH ARMATURE EXTENSION IN RELEASED POSITION
MIN. 8 GRAMS -- MAX. 15 GRAMS
TO JUST SEPARATE CLOSED CONTACTS.

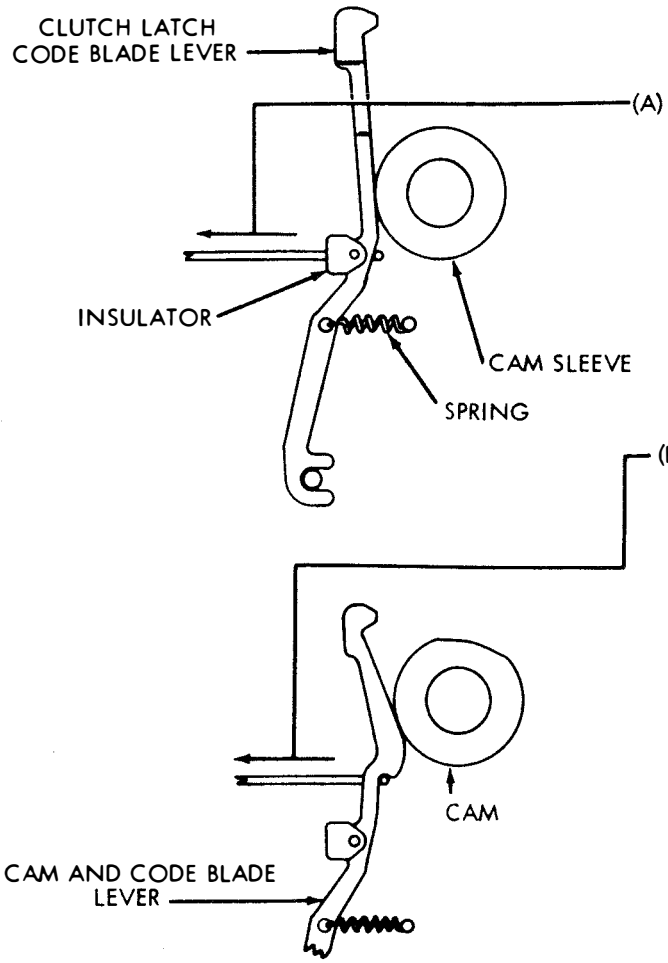
(2) WITH ARMATURE EXTENSION HELD AGAINST MAGNET CORE
MIN. SOME -- MAX. 0.012 INCH
BETWEEN INSULATOR AND ARMATURE EXTENSION.

(3) WITH ARMATURE EXTENSION HELD AGAINST MAGNET CORE
MIN. 0.008 INCH --- MAX. 0.015 INCH
BETWEEN UPPER CONTACTS.

TO ADJUST
POSITION CONTACT ASSEMBLY UP OR DOWN WITH CONTACT ASSEMBLY BRACKET MOUNTING SCREWS LOOSENED.

2. 08 Clutch Latch Contact and Cam and Code Blade Lever Springs (TWX)

NOTE: TO CHECK TENSIONS (A) AND (B), REMOVE ENTIRE ANSWER-BACK MECHANISM FROM ITS BRACKET REMOVE MESSAGE DRUM AND TAKE OFF THE CONTACT BLOCK.



(A) CLUTCH LATCH CONTACT SPRING
REQUIREMENT
MIN. 1/2 OUNCE
MAX. 1-1/2 OUNCES
TO START CLUTCH LATCH CODE BLADE LEVER MOVING WHEN THE LEVER IS RESTING AGAINST CAM SLEEVE.

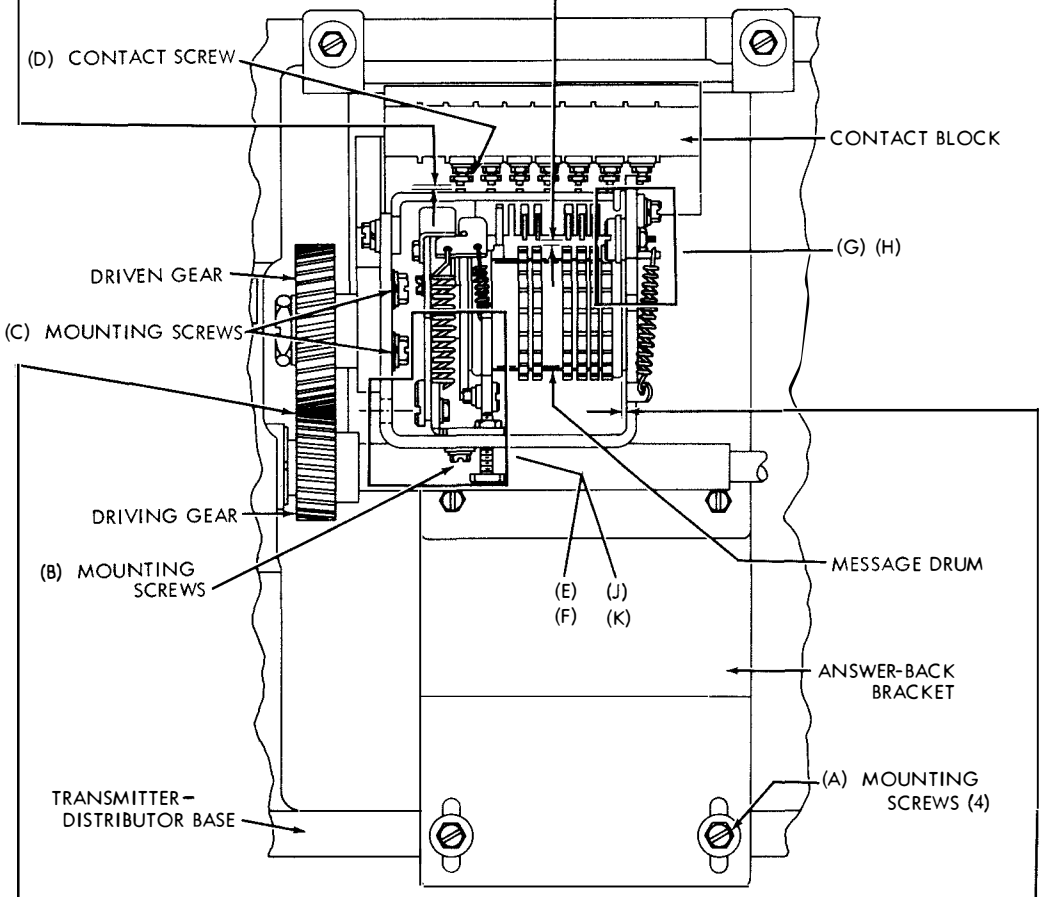
(B) CAM AND CODE BLADE LEVER SPRING
REQUIREMENT
MIN. 1-1/2 OUNCES
MAX. 2-1/2 OUNCES
TO START CAM AND CODE BLADE LEVERS MOVING WHEN THE LEVERS ARE ON HIGH PART OF RESPECTIVE CAMS.

REASSEMBLE ANSWER-BACK MECHANISM.

2.09 Answer-back Assembly

(D) CLUTCH LATCHING CONTACT GAP
REQUIREMENT
GAP BETWEEN CLUTCH LATCHING CONTACTS
MIN. 0.030 INCH
MAX. 0.035 INCH
TO CHECK
ROTATE MESSAGE DRUM UNTIL CLUTCH LATCH CODE BLADE LEVER IS RESTING ON STOP PROJECTION OF STOP BLADE.
TO ADJUST
POSITION CONTACT SCREW.

(C) CAM FOLLOWER CODE BLADE CLEARANCE
REQUIREMENT
CLEARANCE BETWEEN CAM FOLLOWER CODE BLADE AND ASSOCIATED TINE ON CODE BLADE OF MESSAGE DRUM
MIN. 0.007 INCH --- MAX. 0.030 INCH
TO CHECK
DISENGAGE CLUTCH. TINES OF CODE BLADES SHOULD BE OPPOSITE PROJECTIONS OF CAM FOLLOWER CODE BLADES.
TO ADJUST
POSITION BRACKET WITH MOUNTING SCREWS LOOSENED.



TOP VIEW - LEFT SIDE

(A) ANSWER-BACK POSITION
REQUIREMENT
BACKLASH BETWEEN DRIVEN GEAR AND ITS DRIVER
MIN. 0.005 INCH
MAX. 0.010 INCH
TO ADJUST
POSITION ANSWER-BACK BRACKET WITH FOUR MOUNTING SCREWS LOOSENED.

(B) MESSAGE DRUM END PLAY
REQUIREMENT
END PLAY BETWEEN MESSAGE DRUM AND BRACKET OR DRIVE PLATE
MIN. SOME
MAX. 0.012 INCH
TO ADJUST
POSITION REAR MESSAGE DRUM BRACKET WITH THE TWO MOUNTING SCREWS LOOSENED. KEEP BRACKET SQUARE WITH DRUM DRIVE PLATE.

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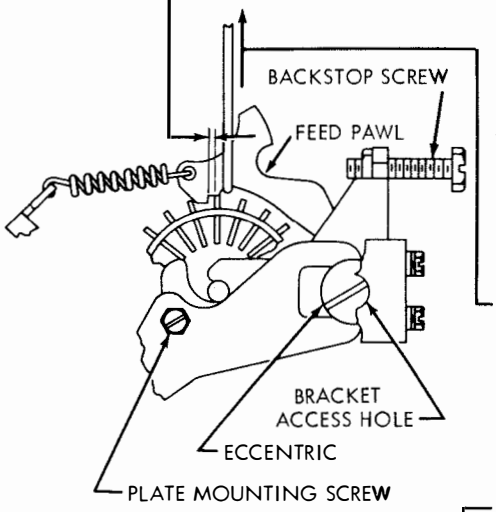
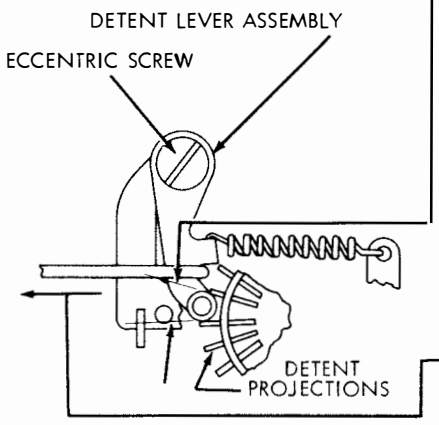
NOTE: WHERE NECESSARY,
REMOVE SHOULDER SCREW AND TAKE OFF ANSWER-BACK DRIVEN GEAR.



(E) FEED PAWL CLEARANCE (PRELIMINARY)
REQUIREMENT
CLEARANCE BETWEEN LATCHING SURFACE OF FEED PAWL AND FEED PROJECTION OF CODE BLADE ON MESSAGE DRUM
MIN. 0.010 INCH
MAX. 0.025 INCH
TO CHECK
DISENGAGE CLUTCH.
TO ADJUST
LOOSEN PLATE MOUNTING SCREW AND ECCENTRIC RETAINING NUT TO FRICTION TIGHT. POSITION ECCENTRIC WITH SCREWDRIVER THROUGH HOLE PROVIDED IN BRACKET. DO NOT TIGHTEN NUT OR SCREW (OR REPLACE DRIVEN GEAR)UNTIL REFINING ADJUSTMENT (I) IS MADE.

(F) FEED PAWL SPRING
REQUIREMENT
MIN. 1 1/2 OZS.
MAX. 2 1/2 OZS.
TO START FEED PAWL MOVING WHEN THE CLUTCH IS DISENGAGED AND FEED PAWL IN STOP POSITION.



(G) DETENT ROLLER POSITION
1. REQUIREMENT
ROLLER ON DETENT LEVER SHALL BE FIRMLY SEATED BETWEEN TWO DETENT PROJECTIONS OF CODE BLADES IN MESSAGE DRUM.
TO CHECK - DISENGAGE CLUTCH.
2. REQUIREMENT
CODE BLADE PROJECTIONS (TINES) ON MESSAGE DRUM SHALL BE CENTRALLY LOCATED WITH RESPECT TO CAM FOLLOWER CODE BLADE (GAUGE BY EYE).
TO CHECK
TRIP CLUTCH, ROTATE MAIN SHAFT TO INDEX MESSAGE DRUM FOR NEXT CHARACTER.
TO ADJUST
POSITION DETENT ROLLER ASSEMBLY BY MEANS OF ECCENTRIC SCREW LOOSENED TO FRICTION TIGHTNESS.

(H) DETENT LEVER SPRING
REQUIREMENT
MIN. 4 OZS.
MAX. 6 OZS.
TO MAKE DETENT LEVER MOVE WHEN ITS ROLLER IS RESTING BETWEEN TWO DETENT PROJECTIONS ON MESSAGE DRUM AND THE CLUTCH DISENGAGED.

(I) FEED PAWL CLEARANCE (FINAL)
RECHECK PRELIMINARY FEED PAWL CLEARANCE ADJUSTMENT (E) AND REFINE IF REQUIRED. TIGHTEN NUT AND SCREW. REPLACE THE DRIVEN GEAR AND SHOULDER SCREW IF PREVIOUSLY REMOVED

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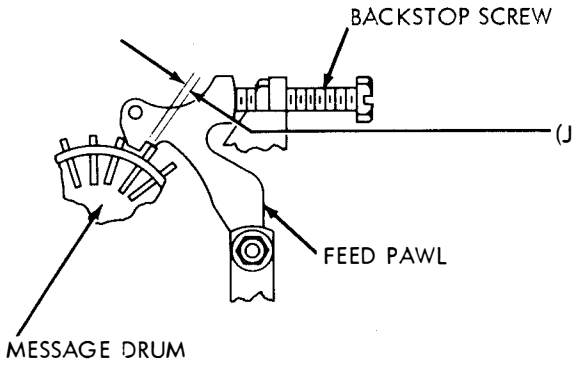
2.09 Answer-back Assembly (Cont)



(J) FEED PAWL BACKSTOP

REQUIREMENT

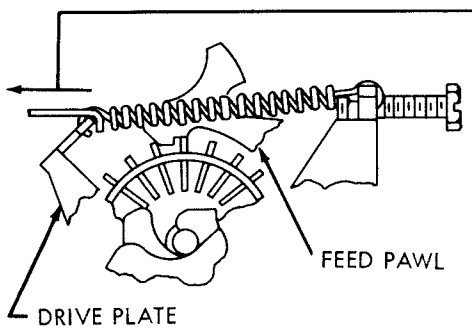
CLEARANCE BETWEEN LATCHING SURFACE OF FEED PAWL AND ADJACENT FEED PROJECTION ON MESSAGE DRUM
MIN. 0.010 INCH
MAX. 0.025 INCH

TO CHECK

TRIP CLUTCH, ROTATE MAIN SHAFT SLOWLY UNTIL FEED PAWL REACHES MAXIMUM REARWARD TRAVEL.

TO ADJUST

LOOSEN LOCK NUT AND POSITION BACKSTOP SCREW.



(K) DRIVE PLATE SPRING

REQUIREMENT

MIN. 18 OZS.
MAX. 24 OZS.
TO MOVE FEED PAWL FROM STOP POSITION (CLUTCH DISENGAGED).

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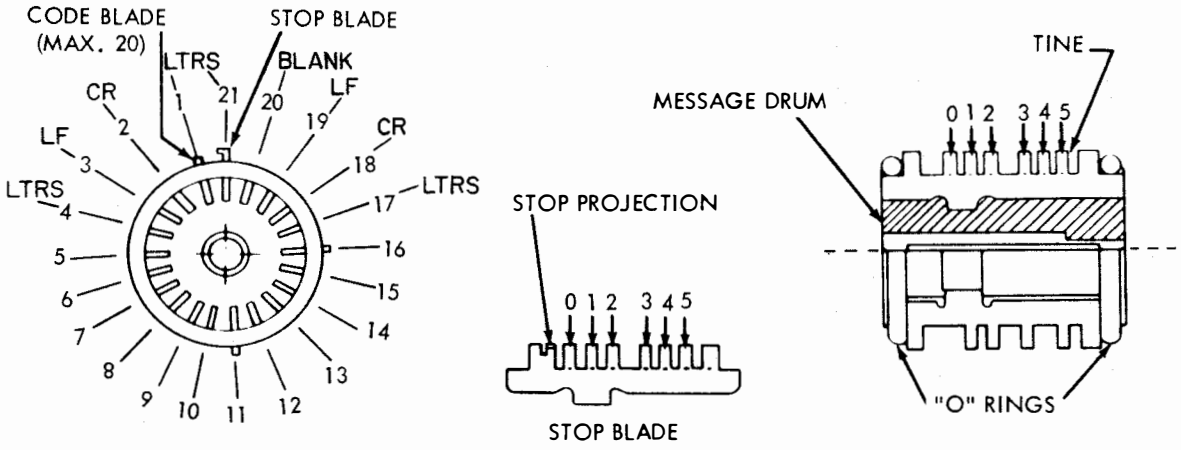
3. CODING THE ANSWER-BACK ASSEMBLY

1. THE MESSAGE DRUM HAS A CAPACITY OF 21 CHARACTERS. CHARACTERS ARE DETERMINED BY DETACHABLE CODE BLADES SET IN THE MESSAGE DRUM. SINCE PROJECTIONS ON THE CODE BLADES ARE USED TO ROTATE THE DRUM, ALL OF ITS 21 SLOTS MUST BE OCCUPIED BY A BLADE.

2. THE LAST CHARACTER TRANSMITTED IS DETERMINED BY A SPECIAL STOP CODE BLADE. THIS CHARACTER MUST ALWAYS BE A LTRS COMBINATION AND ITS POSITION DETERMINES THE LOCATION OF SLOT 21.

3. CODE A BLADE BY BREAKING OFF THE UNWANTED TINES AT THE SCORED LINE AT THE BASE OF THE TINE. TINES WHICH ARE TO BE REMOVED FOR A PARTICULAR CHARACTER ARE SHOWN ON THE FOLLOWING PAGE. TO PREVENT DISTORTION OF A CODE BLADE, EACH BLADE SHOULD BE HELD SECURELY NEAR THE SCORE MARK OF THE TINE TO BE REMOVED.



4. PLACE AN "O" RING IN THE GROOVE ON THE RIM OF THE MESSAGE DRUM WHICH IS FURTHEST FROM THE SLOT IN THE CENTER PORTION OF THE DRUM. INSTALL A STOP BLADE IN SLOT 21 BY FIRST INSERTING THE BLADE UNDER THE "O" RING AND THEN ROTATING THE BLADE TOWARD THE CENTER OF THE DRUM UNTIL IT IS FULLY SEATED.

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3. CODING THE ANSWER-BACK ASSEMBLY (Cont)

5. CODE THE DRUM IN A COUNTERCLOCKWISE DIRECTION BEGINNING WITH THE NO. 1 BLADE ADJACENT TO THE STOP BLADE AS FOLLOWS:

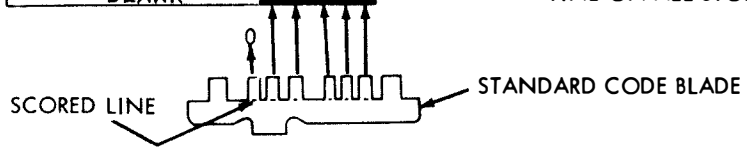
1	LTRS
2	CARRIAGE RETURN
3	LINE FEED
4	LTRS
5-16	CUSTOMER IDENTIFICATION
17	LTRS
18	CARRIAGE RETURN
19	LINE FEED
20	BLANK
21	LTRS (USING THE SPECIAL STOP BLADE)

WHENEVER THE CUSTOMER IDENTIFICATION IS LESS THAN 12 CHARACTERS, USE LTRS CHARACTERS UP TO AND INCLUDING SLOT 16.

■ — LEAVE TINE

□ — REMOVE TINE

LETTERS	TYPICAL FIG. ARRGT.	CODE 1	2	3	4	5
A	—	□	□	■	■	■
B	?	□	■	■	□	□
C	:	■	□	□	□	■
D	$	□	■	■	□	■
E	3	□	■	■	■	■
F	!	□	■	□	□	■
G	&	■	□	□	□	□
H	#	■	■	□	■	□
I	8	■	■	□	□	■
J	'	□	□	■	□	■
K	(	□	□	□	□	■
L	)	■	■	□	■	□
M	.	■	■	□	□	■
N	,	■	■	□	□	□
O	9	■	■	□	■	□
P	0	■	□	■	■	□
Q	1	■	□	■	□	□
R	4	■	□	□	■	■
S	BELL	□	□	■	□	■
T	5	■	■	■	■	□
U	7	□	□	□	■	■
V	;	■	□	□	□	■
W	2	□	□	■	■	□
X	/	□	□	■	□	■
Y	6	□	■	■	□	■
Z	"	□	■	□	■	□
CARRIAGE RETURN		■	■	□	■	■
LINE FEED		■	□	■	□	□
LETTERS SHIFT		□	□	□	■	□
FIGURES SHIFT		□	□	■	□	■
SPACE		■	■	■	□	□
BLANK		■	■	■	■	■



6. AFTER FILLING THE DRUM, ENCIRCLE THE BLADES BY PLACING ANOTHER "O" RING IN THE GROOVE ON THE OPPOSITE RIM OF THE DRUM.

7. PLACE A THIN COAT OF GREASE ON THE SHAFT AND STUD OF THE DRIVE PLATE. INSERT THE SHAFT PORTION OF THE DRIVE PLATE INTO THE MESSAGE DRUM (NOTE THAT DUE TO A DIFFERENCE IN HOLE DIAMETERS IN THE MESSAGE DRUM, THE SHAFT CAN BE INSERTED ONLY ONE WAY). HOOK THE SPRING BETWEEN THE DRIVE PLATE AND THE FEED PAWL. OIL BOTH ENDS OF THE SPRING.

8. TO INSERT THE MESSAGE DRUM ASSEMBLY INTO THE DISTRIBUTOR ASSEMBLY, TRIP THE CLUTCH AND ROTATE THE DISTRIBUTOR MAIN SHAFT UNTIL THE DRIVE LEVER ASSEMBLY IS ON THE HIGH PART OF THE CAM, THEN INSERT THE MESSAGE DRUM ASSEMBLY BETWEEN THE MOUNTING BRACKETS. NOTE THAT THE DRIVE PLATE HAS A STUD WELDED ON TO IT; THIS STUD MUST GO UNDER THE DRIVE LEVER ASSEMBLY. THEN ROTATE THE MAIN SHAFT TO LATCH THE CLUTCH. NEXT HOOK THE DRIVE PLATE SPRING BETWEEN THE DRIVE PLATE AND THE SPRING POST PROJECTION ON THE BRACKET. THE DETENT LEVER SPRING SHOULD BE HOOKED ON TO THE SPRING POST PROJECTION OF THE BRACKET, AND THE DETENT LEVER. LUBRICATE THE MECHANISM ACCORDING TO THE BELL SYSTEM PRACTICE FOR THE 28 TRANSMITTER-DISTRIBUTOR BASE, ANSWER-BACK MECHANISM, LUBRICATION.

NOTE:

1. STOP BLADE HAS SAME PROVISIONS FOR INDIVIDUAL CODING AS STANDARD CODE BLADE.

2. WHEN CODING THE BLADES REMOVE THE "O" POSITION TINE ON ALL STOP AND CODE BLADES.