35 TAPE READER (PARALLEL OUTPUT)

ADJUSTMENTS

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1. GENERAL

1.01 This section is concerned with the adjustment of 8-level tape reader units. Refer to related 574-236- series sections for descriptive information, principle of operation, lubrication, disassembly, and reassembly.

1.02 The adjustment information for the tape reader is divided into "basic unit" adjustments (common to all units) and "variable features" adjustments (adjustments which may vary from unit to unit).

1.03 Adjustment requirements for the tape reader are arranged in the sequence that should be followed if a complete readjustment is undertaken.

1.04 Inspection and minor repair of the unit may be accomplished with the plates removed, however, when more extensive maintenance or a complete readjustment is undertaken, the tape reader should be disconnected from any AC or DC potential and removed from its base.

Note: For instructions on the disassembly and reassembly of the tape reader, see related disassembly and reassembly section.

1.05 References made to left or right, up or down, front or rear, etc consider the tape reader to be viewed from a position such that the tape guide plate is to the viewer's right and on top of the tape reader.

1.06 Tools and spring scales required to perform the adjustments are listed in the appropriate section. They are not supplied as a part of the equipment.

1.07 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 the adjustment.

1.08 The adjusting illustrations, in addition to indicating the adjusting tolerances, positions of parts, and spring tensions, also show the way in which the scale should be positioned when measuring spring tensions.

1.09 The spring tensions given in this section are indications, not exact values. They should be checked with proper spring scales in the positions indicated. Springs which do not meet the requirement and for which no adjusting procedure is given should be replaced by a new spring.

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

1.11 If a part that is mounted with shims is removed, the number of shims at each of its mounting screws should be noted so that the same shim pile-up will be replaced when the part is remounted.

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

1.13 When the requirement calls for the clutch to be disengaged, the clutch shoe lever must be fully latched between its trip lever and the 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.
Figure 1 - Tape Reader
Note 1: When rotating the main shaft 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 screw driver to cause it to engage its latch lever and thus disengage the internal expansion clutch shoes from the clutch drum.

Note 2: The stop position refers to that position where the shoe lever contacts the trip lever with the main ball latched.

1.14 When adjusting contact gaps and spring tensions of contact assemblies with more than one contact pile-up such as code reading contact assemblies, start adjusting with the contact pile-up farthest from the handle of the bending tool. Work towards the contact pile-up nearest the bending tool handle. In this manner completed adjustments will not be disturbed.

1.15 All contact points should meet squarely. Contacts with 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.

1.16 Should the rotor of the synchronous motor become blocked for several seconds by an overload, the thermal cut-out switch will de-energize the motor until the manual reset button is depressed. However, allow at least 5 minutes for the motor to cool before attempting to reset the switch and start the motor.

CAUTION: IMPROPERLY ADJUSTED EQUIPMENT MAY BE SERIOUSLY DAMAGED IN A MATTER OF SECONDS IF OPERATED UNDER POWER. CHECK ALL ADJUSTMENTS BEFORE PUTTING THE TAPE READER INTO OPERATION.

1.17 The line drawings show adjusting tolerances, position of parts, and spring tensions for the tape reader. Where several adjustments are shown on the same page, the sequence to be followed in checking the requirements and making the adjustments is indicated by the letters (A), (B), (C), etc.
2. BASIC UNIT

2.01 Main Shaft and Clutch Trip Mechanisms

(A) CLUTCH TRIP LEVER
TO CHECK
STOP LUG OPPOSITE TRIP LEVER.

(1) REQUIREMENT
MIN 0.012 INCH
MAX 0.025 INCH
BETWEEN STOP LUG AND TRIP LEVER WITH PLAY TAKEN UP TO MAKE A MAXIMUM CLEARANCE.

(2) REQUIREMENT
SOME CLEARANCE BETWEEN STOP LUG AND TRIP LEVER WITH PLAY TAKEN UP TO MAKE A MINIMUM CLEARANCE.

TO ADJUST LOOSEN NUT ON ECCENTRIC POST FRICTION TIGHT. ROTATE ECCENTRIC POST TO ITS LOWEST POSITION OR UNTIL REQUIREMENT IS MET.

(D) CLUTCH SHOE LEVER
TO CHECK CLUTCH DISENGAGED. MEASURE GAP BETWEEN STOP LUG AND SHOE LEVER.

REQUIREMENT
WITH CLUTCH ENGAGED,
MIN 0.055 INCH
MAX 0.085 INCH
GREATER GAP BETWEEN STOP LUG AND SHOE LEVER THAN WHEN DISENGAGED.

TO ADJUST LOOSEN CLAMP SCREWS, ROTATE ADJUSTING PLATE BY ENGAGING ADJUSTING PLATE EXTENSION WITH WRENCH OR SCREWDRIVER.

NOTE
1. POSITIVELY ENGAGE CLUTCH BY PULLING SHOE LEVER WITH A FORCE OF 32 OZ. RELEASE SLOWLY.
2. ADJUST TOWARDS MINIMUM REQUIREMENT ON TWO-STOP CLUTCHES.
3. AFTER MAKING ABOVE ADJUSTMENT, DISENGAGE CLUTCH. ROTATE DRUM IN NORMAL DIRECTION AND CHECK TO SEE IF IT DRAGS ON SHOE. IF IT DOES, REFINE ADJUSTMENT.
2.02 Main Shaft and Clutch Trip Mechanism (continued)

NOTE
CLUTCH SHOE LEVER SPRING AND
CLUTCH SHOE SPRING ADJUSTMENTS ARE PERFORMED AT FACTORY. THEY SHOULD NOT BE
DISTURBED UNLESS ASSOCIATED MECHANISMS HAVE BEEN REMOVED FOR SERVICING OR
THERE IS REASON TO BELIEVE THAT THE REQUIREMENTS ARE NOT MET.

(A) CLUTCH SHOE LEVER SPRING
REQUIREMENT
CLUTCH ENGAGED,
MIN 15 OZ ---
MAX 20 OZ
TO MOVE SHOE LEVER
INTO CONTACT WITH
STOP LUG.

(B) CLUTCH SHOE SPRING
TO CHECK
REMOVE CLUTCH DRUM.
REQUIREMENT
MIN 3 OZ --- MAX 5 OZ
TO START PRIMARY SHOE
MOVING.
2.03 Cover and Top Plate Area

(A) TAPE LID BRACKET
TO CHECK
REMOVE TOP AND TAPE GUIDE PLATES, LUBRICATE THEM ACCORDING TO THE RELATED LUBRICATION SECTION.
REQUIREMENT
WITH TAPE LID PRESSED AGAINST NOTCH IN TAPE GUIDE PLATE, FEED WHEEL GROOVE LINED UP WITH SLOT IN TAPE GUIDE PLATE, AND TAPE-OUT PIN HOLES LINED UP,
MIN SOME --- MAX 0.010 INCH
CLEARANCE BETWEEN TAPE LID AND PIVOT SHOULDER.
TO ADJUST
LOOSEN TAPE LID BRACKET MOUNTING NUTS. WHILE PRESSING TAPE LID AGAINST NOTCH IN TAPE GUIDE PLATE, LINE UP FEED WHEEL GROOVE WITH SLOT IN TAPE GUIDE PLATE USING TIP OF TP170283 GAUGE. VISUALLY LINE UP TAPE-OUT PIN HOLE IN TAPE GUIDE PLATE WITH HOLE IN TAPE LID, POSITION TAPE LID BRACKET.

(B) BEARING BRACKET
REQUIREMENT
WITH FRONT BEARING SURFACE OF TAPE LID TOUCHING TAPE GUIDE PLATE,
MIN 0.010 INCH --- MAX 0.018 INCH
CLEARANCE BETWEEN TAPE LID AND TAPE GUIDE PLATE MEASURED AT TAPE LID FIN THAT IS IN LINE WITH REAR TAPE GUIDE.
TO ADJUST
LOOSEN BEARING BRACKET MOUNTING SCREWS FRICTION TIGHT. WHILE PRESSING TAPE LID AGAINST TAPE GUIDE PLATE, POSITION BEARING BRACKET. RECHECK 2.03(A).
NOTE

WHEN BOTH TOP AND TAPE GUIDE PLATES ARE ASSEMBLED ON UNIT, THE FRONT BEARING SURFACE OF THE TAPE LID MAY TOUCH TOP PLATE. IF IT DOES, THERE MAY BE CLEARANCE BETWEEN TAPE LID AND TAPE GUIDE PLATE.

LATCH BAIL REQUIREMENT

WITH TAPE LID LATCHED AGAINST TAPE GUIDE PLATE, SOME END PLAY IN TAPE LID RELEASE BUTTON.

TO ADJUST LOOSEN NUT ON LATCH BAIL ECCENTRIC FRICTION TIGHT. RAISE TAPE LID AND ROTATE HIGH PART OF LATCH BAIL ECCENTRIC TOWARDS BEARING BRACKET. CLOSE TAPE LID AND CONTINUE ROTATING HIGH PART OF LATCH BAIL ECCENTRIC TOWARDS BEARING BRACKET UNTIL LATCH BAIL JUST FALLS UNDER THE FLAT ON THE POST. RECHECK OPERATION OF LATCH BAIL BY DEPRESSING TAPE LID RELEASE BUTTON WITH TAPE LID HELD DOWN.
2.05 Cover and Top Plate Area (continued)

**TAPE GUIDE**

(1) **REQUIREMENT**
MIN SOME --- MAX 0.003 INCH CLEARANCE BETWEEN GAUGE AND TAPE GUIDES.

(2) **REQUIREMENT**
EDGE OF WEAR PLATE FLUSH WITH EDGE OF TAPE GUIDE PLATE.

(3) **REQUIREMENT**
NO RIDING OF TAPE UP THE SIDES OF TAPE GUIDES.

TO ADJUST
LOOSEN TAPE GUIDE MOUNTING NUTS FRICITION TIGHT. POSITION WEAR PLATE UNTIL IT OVERHANGS TAPE GUIDE PLATE. UNLATCH TAPE LID AND PLACE TP170283 GAUGE BETWEEN TAPE GUIDES WITH CENTER STUD OF GAUGE IN FEED HOLE SLOT OF TAPE GUIDE PLATE AND WEAR PLATE. PUSH GAUGE HORIZONTALLY UNTIL REMAINING TWO STUDS OF GAUGE BUTT UP AGAINST TAPE GUIDE PLATE THUSLY POSITIONING EDGE OF WEAR PLATE FLUSH WITH EDGE OF TAPE GUIDE PLATE. TIGHTEN ONE TAPE GUIDE MOUNTING NUT. POSITION SECOND TAPE GUIDE TO MEET REQUIREMENT (1). TIGHTEN SECOND TAPE GUIDE MOUNTING NUT. LOOSEN FIRST TAPE GUIDE MOUNTING NUT FRICITION TIGHT AND POSITION TAPE GUIDE TO MEET REQUIREMENT (1). TIGHTEN FIRST TAPE GUIDE MOUNTING NUT.

**NOTE**
TAPE GUIDES MAY TOUCH GAUGE, BUT MUST NOT BIND AGAINST GAUGE WHEN IT IS REMOVED.
2.06 Cover and Top Plate Area (continued)

(A) **CONTROL LEVER DETENT SPRING**
   TO CHECK
   CONTROL LEVER IN RUN POSITION.
   REQUIREMENT
   **MIN 14 OZ --- MAX 22 OZ**
   TO START DETENT BAIL MOVING.

(B) **TAPE LID RELEASE BUTTON SPRING**
   TO CHECK
   TAPE LID UNLATCHED, HOLD
   TAPE GUIDE PLATE IN HORIZONTAL POSITION.
   REQUIREMENT
   **MIN 30 OZ --- MAX 40 OZ**
   TO START THE LATCH BAIL MOVING.

(C) **TAPE LID SPRING**
   TO CHECK
   TAPE LID RELEASE BUTTON FULLY DERESSED, HOLD TAPE GUIDE PLATE IN HORIZONTAL
   POSITION.
   REQUIREMENT
   **MIN 1/8 OZ --- MAX 1 OZ**
   TO MOVE TAPE LID AGAINST TAPE GUIDE PLATE.
2.07 Cover and Top Plate Area (continued)

NOTE

TO PREVENT DAMAGE TO THE TAPE-OUT PIN (2.10), POSITION STOP ARM (2.12) TO ITS LOWERMOST POSITION AND HOLD CONTROL LEVER BAIL EXTENSION (2.14) FROM FEED WHEEL RATCHET (2.18).

(A) FEED WHEEL POST

REQUIREMENT

FEED WHEEL POST IS NOT TO INTERFERE WITH TOP OR TAPE GUIDE PLATE MOUNTING BRACKETS. TO ADJUST

LOosen MOUNTING NUT AND ROTATE POST TO MEET REQUIREMENT.

(B) TAPE GUIDE PLATE

(1) REQUIREMENT

TAPE GUIDE PLATE TO REST FIRMLY AGAINST A MINIMUM OF THREE OF THE FOUR PROJECTIONS ON FRONT AND REAR PLATES.

TO ADJUST

ROTATE MAINSHAFT TO ITS STOP POSITION AND TRIP CLUTCH TO PUT SENSING FINGERS (2.20) IN THEIR UPPERMOST POSITION, UNLATCH TAPE LID AND PLACE CONTROL LEVER IN RUN POSITION, LOOSEN MOUNTING SCREWS AND MOUNTING BRACKET NUTS FRICTION TIGHT, POSITION TAPE GUIDE PLATE ON UNIT MAKING CERTAIN THAT TAPE GUIDE PLATE IS FIRMLY POSITIONED TO MEET REQUIREMENT. POSITION TAPE-OUT PIN (2.10) INTO HOLE IN TAPE GUIDE PLATE. TIGHTEN MOUNTING SCREWS.

NOTE

MOUNTING BRACKET NUTS LOOSENED IN REQUIREMENT (1) ABOVE ARE TIGHTENED AFTER PERFORMING ADJUSTMENT 2.08 AND REQUIREMENT (2) BELOW.

(2) REQUIREMENT

EDGE OF TAPE GUIDE PLATE TO PROJECT OVER FRONT AND REAR PLATES BY EQUAL AMOUNTS AS GAUGED BY EYE.

TO ADJUST

POSITION TAPE GUIDE PLATE.

NOTE

TIGHT-TAPE BAIL EXTENSION (2.15) MUST BE UNDER TOP PLATE.
2.08 Cover and Top Plate Area (continued)

(A) TOP PLATE
   TO CHECK
   REMOVE COVER PLATE (SEE RELATED DISASSEMBLY AND REASSEMBLY SECTION).

(1) REQUIREMENT
   WITH TAPE LID UNLATCHED,
   MIN FLUSH --- MAX 0.003 INCH
   BELOW TOP SURFACE OF TAPE GUIDE PLATE ALONG WIDTH OF TAPE LID WHEN TOP PLATE IS
   RESTING ON A MINIMUM OF FIVE OF THE SIX PROJECTIONS ON FRONT AND REAR PLATES.
   TO ADJUST
   LOOSEN MOUNTING SCREWS AND MOUNTING BRACKET NUTS FRICITION TIGHT. POSITION TOP
   PLATE TO MEET REQUIREMENT (1). TIGHTEN MOUNTING SCREWS. TIGHTEN TAPE GUIDE PLATE
   MOUNTING BRACKET NUTS LEFT FRICITION TIGHT IN ADJUSTMENT 2.07.

   NOTE
   MOUNTING BRACKET NUTS LOOSENED IN REQUIREMENT (1) ABOVE ARE TIGHTENED AFTER PER-
   FORMING REQUIREMENT (2) BELOW.

(2) REQUIREMENT
   WITH TAPE LID UNLATCHED, FEED WHEEL SLOT TO ALIGN WITH SLOT IN TAPE GUIDE PLATE
   SO THAT FEED WHEEL (2.16) ROTATES FREELY WITH CONTROL LEVER IN FREE POSITION.
   TO ADJUST
   POSITION TOP PLATE TOWARD FRONT OR REAR PLATE. TIGHTEN MOUNTING BRACKET NUTS
   LEFT FRICITION TIGHT IN REQUIREMENT (1) ABOVE.

(B) TAPE LID
   REQUIREMENT
   WITH TAPE LID LATCHED,
   MIN 0.010 INCH --- MAX 0.025 INCH
   CLEARANCE BETWEEN TAPE LID PROJECTION AND TOP PLATE WITH PLAY TAKEN UP TOWARD
   TAPE GUIDE PLATE.
   TO ADJUST
   LOOSEN TAPE LID BEARING BRACKET MOUNTING SCREWS (2.03). POSITION TAPE LID TO MEET
   REQUIREMENT. RECHECK ADJUSTMENTS 2.03(A) AND (B).
2.09 Cover and Top Plate Area (continued)

(A) COVER PLATE
1. REQUIREMENT
   Right edge of cover plate to be held flush against left edge of top plate by
   cover plate detenting nuts.

(B) COVER PLATE DETENT SPRING
1. REQUIREMENT
   Min 28 oz
   Max 48 oz
   To start plunger moving.

2. NOTE
   Outer edge of each mounting bracket should be approximately in line with
   shoulder of its mounting stud.
   Outer edge of each mounting bracket to be approximately in line with
   shoulder of its mounting stud and parallel to edge of plate.

3. NOTE
   1. Outer edge of each mounting bracket to be approximately in line with
      shoulder of its mounting stud and parallel to edge of plate.
   2. Cover, top, and tape guide plates to be approximately flush and in line
      with each other.
2.10 Tape-Out Contact Assembly

BREAK-MAKE CONTACT SPRING
TO CHECK
SPRING BRACKET LOOSENED, POSITION SPRING BRACKET UNTIL TAPE-OUT PIN EXTENSION NO LONGER TOUCHES INSULATION ON BREAK-MAKE CONTACT SPRING.

(1) REQUIREMENT
MIN 8 GRAMS --- MAX 15 GRAMS
TO SEPARATE NORMALLY CLOSED CONTACTS.

(2) REQUIREMENT
MIN 0.008 INCH --- MAX 0.015 INCH
GAP BETWEEN NORMALLY OPEN CONTACTS.

TO ADJUST
REMOVE TAPE-OUT CONTACT ASSEMBLY FROM UNIT BY UNHOOKING TAPE-OUT PIN SPRING AND REMOVING CONTACT ASSEMBLY BRACKET MOUNTING SCREWS. BEND BREAK-MAKE CONTACT SPRING AND/OR MAKE CONTACT SPRING WITH TP110445 BENDER UNTIL REQUIREMENTS (1) AND (2) ARE MET.
2.11 Tape-Out Contact Assembly (continued)

(A) TAPE-OUT PIN SPRING
TO CHECK
PLACE CONTROL LEVER (2.06) IN RUN POSITION.

REQUIREMENT
MIN 38 GRAMS --- MAX 45 GRAMS
TO MOVE TAPE-OUT PIN TO A POSITION FLUSH WITH TAPE GUIDE PLATE.
TO ADJUST
LOOSEN LOWER MOUNTING SCREW OF CONTACT ASSEMBLY BRACKET. POSITION SPRING BRACKET.

(b) ASSEMBLY BRACKET
TO CHECK
INSERT TAPE UNDER TAPE LID (2.07) TO HOLD TAPE-OUT PIN DOWN.

REQUIREMENT
MIN 0.006 INCH --- MAX 0.020 INCH
CLEARANCE BETWEEN TAPE-OUT PIN UPPER EXTENSION AND Underside OF INSULATION ON BREAK-MAKE CONTACT SPRING.
TO ADJUST
LOOSEN CONTACT ASSEMBLY BRACKET MOUNTING SCREWS AND ADJUST BRACKET UNTIL REQUIREMENT IS MET.
2.12 Tape-Out Pin Mechanism

(A) STOP ARM
TO CHECK
PLACE CONTROL LEVER (2.06) IN STOP POSITION.
REQUIREMENT
TAPE-OUT PIN TO BE
MIN FLUSH --- MAX 0.010 INCH
BELOW SURFACE OF TAPE GUIDE PLATE.
TO ADJUST
LOosen STOP ARM SCREW, POSITION STOP ARM. RECHECK REQUIREMENT.

(B) TAPE-OUT BAIL
TO CHECK
PLACE CONTROL LEVER (2.06) IN RUN POSITION.
REQUIREMENT
MIN 0.055 INCH
CLEARANCE BETWEEN LOWER TAPE-OUT PIN EXTENSION AND TAPE-OUT BAIL EXTENSION.
TO ADJUST
LOosen INTERMEDIATE TAPE-OUT BAIL SCREW, POSITION TAPE-OUT BAIL. RECHECK REQUIREMENT 2.12(A).
2.13 Tape-Out Pin Mechanism (continued)

(A) **TAPE-OUT TORSION SPRING**
- **TO CHECK**
- CONTROL LEVER (2.06) IN STOP POSITION, UNHOOK ONE END OF INTERMEDIATE TAPE-OUT BAIL SPRING.

**REQUIREMENT**
- MIN 3 OZS, --- MAX 5-1/2 OZS,
- TO START INTERMEDIATE TAPE-OUT BAIL MOVING.

(B) **INTERMEDIATE TAPE-OUT BAIL SPRING**
- **TO CHECK**
- CONTROL LEVER (2.06) IN RUN POSITION, UNHOOK INTERMEDIATE TAPE-OUT BAIL SPRING AT POST END.

**REQUIREMENT**
- MIN 3 OZS, --- MAX 5 OZS,
- TO PULL SPRING TO INSTALLED LENGTH.
2.14 Tight-Tape Mechanism

(A) CONTROL CONTACT ASSEMBLY BRACKET

TO CHECK
PLACE CONTROL LEVER (2.06) IN RUN POSITION.

REQUIREMENT
MIN 0.006 INCH --- MAX 0.015 INCH
CLEARANCE BETWEEN EXTENSION ON CONTROL LEVER BAIL AND INSULATOR ON
BREAK CONTACT SPRING.

TO ADJUST
LOOSEN CONTROL CONTACT ASSEMBLY MOUNTING BRACKET SCREWS AND POSITION MOUNT-
ING BRACKET.

(B) BREAK CONTACT SPRING

REQUIREMENT
INSULATOR ON BREAK CONTACT SPRING TO BE FULLY ENGAGED BY CONTROL LEVER BAIL
EXTENSION AND TIGHT-TAPE INTERMEDIATE ARM EXTENSION.

TO ADJUST
LOOSEN CONTACT ASSEMBLY PILE-UP MOUNTING SCREWS AND POSITION BREAK CONTACT SPRING.
2.15 Tight-Tape Mechanism (continued)

(A) CONTROL CONTACT SPRING
TO CHECK
PLACE CONTROL LEVER (2.06) IN RUN POSITION.

REQUIREMENT
MIN 3 OZS. --- MAX 4 OZS.
TO SEPARATE CONTACTS.
TO ADJUST
BEND BREAK CONTACT SPRING WITH TP110445 SPRING BENDER TO MEET REQUIREMENT. RE-
CHECK CONTROL CONTACT ASSEMBLY BRACKET AND TIGHT-TAPE INTERMEDIATE ARM ADJUST-
MENTS.

(B) INTERMEDIATE ARM
TO CHECK
PLACE CONTROL LEVER (2.06) IN RUN POSITION.

REQUIREMENT
CONTACTS OF CONTROL CONTACT ASSEMBLY TO OPEN WHEN TIGHT-TAPE BAIL RAISED,
MIN 0.045 INCH --- MAX 0.075 INCH
AWAY FROM TAPE GUIDE PLATE.
TO ADJUST
LOOSEN TIGHT-TAPE INTERMEDIATE ARM SCREW AND POSITION TIGHT-TAPE INTERMEDIATE ARM
USING PRY POINT.

(C) INTERMEDIATE ARM SPRING
TO CHECK
PLACE CONTROL LEVER (2.06) IN RUN POSITION.

REQUIREMENT
MIN 20 GRAMS --- MAX 40 GRAMS
TO START YIELD ARM MOVING.
2.16 Main Bail Mechanism

(A) TRANSFER LEVER GUIDE POST
TO CHECK
PLACE MAINSHAFT IN STOP POSITION AND DISENGAGE CLUTCH.
REQUIREMENT
TIP OF HIGHEST SENSING FINGER TO BE
MIN FLUSH --- MAX 0.005 INCH
BELOW TOP SURFACE OF TAPE GUIDE PLATE.
TO ADJUST
LOOSEN NUTS SECURING TRANSFER LEVER GUIDE POST (2.19) AND ROTATE
GUIDE POST TO MEET REQUIREMENT. TIGHTEN NUTS. ROTATE MAINSHAFT WHILE
CHECKING PROPER OPERATION OF MOVING PARTS.

(B) MAIN BAIL SPRING
TO CHECK
CLUTCH DISENGAGED, UNHOOK LOWER END OF MAIN BAIL SPRING.
REQUIREMENT
MIN 6 OZ --- MAX 10 OZ
TO PULL MAIN BAIL SPRING TO INSTALLED LENGTH.

(C) FEED WHEEL RATCHET DETENT SPRING
TO CHECK
WITH MAINSHAFT IN STOP POSITION, HOLD FEED PAWL (2.18) AWAY FROM
FEED WHEEL RATCHET.
REQUIREMENT
MIN 8 OZ --- MAX 13 OZ
TO START FEED WHEEL RATCHET DETENT MOVING.
2.17 Tape Sensing Mechanism

(A) FEED WHEEL DETENT
TO CHECK
SENSING FINGERS DOWN, TAPE LID (2.06(B))
UNLATCHED, HIGH PART OF FEED WHEEL
RATCHET DETENT ECCENTRIC (2.16) TOWARD
RIGHT, PLACE A NEW PIECE OF LETTERS PER-
FORATED TAPE ON FEED WHEEL, TAKE UP
PLAY IN THE TAPE LIGHTLY TOWARD RIGHT.

REQUIREMENT
TIP OF EACH SENSING FINGER TO BE CENT-
TRALLY LOCATED IN ITS CODE HOLE.
TO ADJUST
LOOSEN FEED WHEEL RATCHET DETENT ECCENTRIC
(2.16) FRICTION TIGHT AND HOLD FEED PAWL
(2.18) AWAY FROM FEED WHEEL RATCHET (2.18).
ROTATE FEED WHEEL RATCHET DETENT ECCENTRIC.

(B) SENSING FINGER SPRING
TO CHECK
CLUTCH TRIPPED, PLACE SENSING FINGERS
IN THEIR UPPERMOST POSITION.

REQUIREMENT
MIN. MAX.
2 OZ --- 3 OZ

TO MOVE SENSING FINGERS FLUSH
WITH TAPE GUIDE PLATE.
2.18 Tape Feed Mechanism

(A) FEED PAWL
TO CHECK
HIGH PART OF FEED PAWL
ECCENTRIC TOWARD RIGHT,
CLUTCH TRIPPED, ROTATE
MAINSHAFT UNTIL MAIN
BAIL IS AT ITS LOWER-
MOST POSITION WITH
FEED WHEEL RATCHET DE-
TENT (2.16) ENGAGED.

(1) REQUIREMENT
NO PERCEPTIBLE BACK-
LASH BETWEEN FEED
PAWL AND FEED WHEEL
RATCHET TOOTH WHEN
JUST ENGAGED.

(2) REQUIREMENT
NO OVERDRIVING OF
FEED WHEEL BY FEED
PAWL BEYOND DE-
TENTED POSITION,
TO ADJUST
LOOSEN FEED PAWL EC-
CENTRIC AND ROTATE,
RECHECK REQUIREMENTS
(1) AND (2) WITH FEED
WHEEL OIL HOLE UP.

(B) FEED PAWL SPRING
TO CHECK
PLACE MAINSHAFT IN STOP POSITION.

REQUIREMENT
MIN 2 OZ --- MAX 3-1/2 OZ
TO START FEED PAWL MOVING.

2.19 Tape Sensing Mechanism (continued)

TRANSFER LEVER

TRANSFER LEVER SPRING
TO CHECK
PLACE MAINSHAFT IN STOP PO-
SITION.

REQUIREMENT
MIN 1/2 OZ --- MAX 1-1/2 OZ
TO START EACH LEVER MOVING.
2.20 Main Bail Mechanism (continued)

(A) MAIN BAIL TO CHECK
   PLACE SENSING FINGERS IN THEIR LOWERMOST
   POSITION.
   REQUIREMENT
   MIN 0.005 INCH --- MAX 0.015 INCH
   BETWEEN TOP OF MAIN BAIL AND LOWER
   SURFACE OF MAIN BAIL LATCH.
   TO ADJUST
   LOOSEN MAIN BAIL ECCENTRIC FRICTION TIGHT
   AND POSITION ECCENTRIC. RECHECK THIS AND
   ADJUSTMENT (2.16A).

(b) LOCKING BAIL SPRING
   TO CHECK
   PLACE MAINSHAFT IN STOP POSITION.
   REQUIREMENT
   MIN 6-1/2 OZ --- MAX 10-1/2 OZ
   TO START LOCKING BAIL MOVING.
2.21 Clutch Magnet Assembly

(A) ARMATURE BAIL HINGE
   TO CHECK
   ARMATURE IN ENERGIZED POSITION.
   REQUIREMENT
   ARMATURE TO CONTACT CORE FACE OF TOP MAGNET WITH
   MIN SOME --- MAX 0.004 INCH
   CLEARANCE BETWEEN ARMATURE AND CORE FACE OF BOTTOM
   MAGNET AT POINT OF LEAST CLEARANCE.
   TO ADJUST
   REMOVE CLUTCH MAGNET MOUNTING BRACKET SCREWS
   AND LIFT CLUTCH MAGNET ASSEMBLY FROM UNIT.
   LOOSEN HINGE MOUNTING SCREWS AND POSITION
   HINGE.

(B) BACKSTOP ECCENTRIC
   TO CHECK
   WITH HIGH PART OF BACK STOP ECCENTRIC TOWARDS
   TOP OF UNIT, HOLD ARMATURE IN ENERGIZED POSI-
   TION.
   REQUIREMENT
   MIN 0.045 INCH --- MAX 0.055 INCH
   CLEARANCE BETWEEN ARMATURE BAIL AND BACKSTOP ECCENTRIC.
   TO ADJUST
   LOOSEN BACKSTOP ECCENTRIC AND POSITION.
2.22 Clutch Magnet Assembly (continued)

(A) ASSEMBLY
TO CHECK
WITH CLUTCH MAGNET ASSEMBLY REPLACED INTO UNIT
IN ITS LOWEST POSITION AND CLUTCH MAGNET
BRACKET MOUNTING SCREWS FRICITION TIGHT, DIS-
ENGAGE CLUTCH.

REQUIREMENT
MIN 0.007 INCH --- MAX 0.015 INCH
CLEARANCE BETWEEN END OF ARMATURE BAIL EXTEN-
SION AND MAIN BAIL LATCH.
TO ADJUST
POSITION CLUTCH MAGNET ASSEMBLY AT PRY POINT.
RECHECK REQUIREMENT.

NOTE
IF AC POWER IS USED, MAKE A CHECK OF ARMATURE
CHATTER, IT MUST BE A MINIMUM, IF EXCESSIVE CHAT-
TER IS PRESENT, REFINE REQUIREMENT (2.21(A)) AND
RECHECK REQUIREMENTS (2.21(B)) AND (2.22(A)).

(C) MAIN BAIL LATCH SPRING
TO CHECK
RELEASE MAIN BAIL LATCH.
REQUIREMENT
MIN 3/4 OZ --- MAX 2 OZ
TO START MAIN BAIL LATCH MOVING.

(B) ARMATURE BAIL SPRING
TO CHECK
ARMATURE IN DE-ENERGIZED POSITION, HOLD MAIN
BAIL LATCH AWAY FROM ARMATURE BAIL EXTENSION.
REQUIREMENT
MIN 1 OZ --- MAX 2 OZ
TO START ARMATURE MOVING.
2.23 Code Reading Contacts

Initial Adjustments

NOTE
INITIAL ADJUSTMENTS SHOULD BE MADE WITH THE CODE READING CONTACT ASSEMBLY REMOVED FROM THE TRANSMITTER UNIT.

(A) NORMALLY CLOSED CONTACTS - BACKSTOP
REQUIREMENT
THE LOWER CONTACT LEAVES FOR ALL LEVELS SHOULD BE PARALLEL TO THE MOUNTING PLATE AND IN LINE WITH ONE ANOTHER.
TO ADJUST
BEND BACKSTOP TO MEET REQUIREMENT.

(B) NORMALLY CLOSED CONTACTS - SPRING TENSION
REQUIREMENT
(1) WITH SWINGER HELD AWAY
MIN 2 OZ --- MAX 6 OZ
TO MOVE LOWER CONTACT LEAF AWAY FROM BACKSTOP.
TO ADJUST
BEND LOWER LEAF. IF IT IS NECESSARY TO BEND BACKSTOP TO OBTAIN REQUIRED TENSION, REPOSITION BACKSTOP TO MEET NORMALLY CLOSED CONTACTS - BACKSTOP REQUIREMENT.
(2) MIN 30 GRAMS --- MAX 40 GRAMS
TO OPEN NORMALLY CLOSED CONTACTS.
TO ADJUST
BEND SWINGER.

(C) NORMALLY OPEN CONTACTS - BACKSTOP
REQUIREMENT
MIN 0.010 INCH --- MAX 0.015 INCH
GAP BETWEEN NORMALLY OPEN CONTACTS.
TO ADJUST
BEND ASSOCIATED BACKSTOP TO MEET REQUIREMENT.

(D) NORMALLY OPEN CONTACTS - SPRING TENSION
REQUIREMENT
MIN 30 GRAMS --- MAX 40 GRAMS
TO MOVE NORMALLY OPEN CONTACTS AWAY FROM BACKSTOP.
TO ADJUST
BEND UPPER CONTACT LEAF. IF IT IS NECESSARY TO BEND BACKSTOP TO OBTAIN REQUIRED TENSION, REPOSITION BACKSTOP TO MEET REQUIREMENT (2.23(C)).
2.24 Code Reading Contacts (continued)

Secondary Adjustments

NOTE

THE SECONDARY ADJUSTMENTS SHOULD BE MADE WITH THE CODE READING CONTACT ASSEMBLY INSTALLED IN THE TRANSMITTER, WITH THE CONTACT ASSEMBLY BRACKET APPROXIMATELY CENTERED IN ITS ADJUSTMENT RANGE.

(A) CONTACT ASSEMBLY

REQUIREMENT

THE SWINGER OF EACH CONTACT PILE-UP SHOULD BE ALIGNED WITH ITS ASSOCIATED SENSING ARM, AS GAGED BY EYE.

TO ADJUST

LOosen THE SCREWS WHICH MOUNT THE CONTACT ASSEMBLY TO THE CONTACT BRACKET, AND POSITION THE ASSEMBLY TO MEET REQUIREMENT.

(B) CONTACT BRACKET

REQUIREMENT

WITH THE BLANK COMBINATION SELECTED AND THE UP-STOP POST OUT OF THE WAY

MIN 0.015 INCH --- MAX 0.025 INCH

GAP BETWEEN CONTACT ASSEMBLY SWINGERS AND INSULATOR ON CONTACT SENSING ARM.

TO ADJUST

LOosen THE CONTACT BRACKET MOUNTING SCREWS (2.24(A)) AND POSITION THE BRACKET TO MEET REQUIREMENTS.
2.25 Code Reading Contacts (continued)

Secondary Adjustments (continued)

(A) **Eccentric Up-Stop Requirement**

With letters combination selected, clutch engaged, and main shaft rotated until the sensing arms are in their uppermost position, there should be some --- to --- 0.008 inch clearance between the upper contact leaf and its backstop.

To adjust loosen the nut that secures the eccentric up-stop to the front plate and turn the eccentric until the requirement is satisfied. The high part of the eccentric should be toward left.

(B) **Sensing Arm Spring Requirement**

With clutch disengaged

Min 2-1/2 oz

Max 3-1/2 oz

To start sensing arm moving.

(C) **Sensing Arm Eccentric Requirement**

With the blank combination selected and clutch tripped, clearance between the transfer levers and associated sensing arms.

Min 0.020 inch

Max 0.030 inch

To adjust rotate the split bail eccentric with its lock nut loosened.
2.26 Code Reading Contacts (continued)

Final Adjustments (Strobing)

CONTACT BRACKET

NOTE

A DXD OPERATING AT 600 OPM WITH AN 11 UNIT CODE SCALE SHALL BE USED FOR STROBING.

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CODE READING CONTACT TIMING

MIN 625 DIV --- MAX 708 DIV

REQUIREMENTS
(1) MARKING PULSE (TRACE) LENGTH
   MIN 625 --- MAX 708 SCALE DIVISIONS

(2) MARKING PULSE BREAKS TO BE CONFINED TO FIRST AND LAST 15 SCALE DIVISIONS OF TRACE.

(3) SPACING PULSE (TRACE) LENGTH FULL SCALE TRACE WITHOUT BREAKS.

TO ADJUST
LOosen THE CONTACT BRACKET MOUNTING SCREWS AND POSITION BRACKET TO MEET REQUIREMENTS.

NOTE

IF REQUIREMENTS CANNOT BE MET, RE-CHECK INITIAL AND SECONDARY ADJUSTMENTS AND RENEW IF NECESSARY.
2.27 Auxiliary No. 1 Contact Assembly

Initial Adjustments

NOTE

The initial adjustments should be made with the auxiliary contacts removed from the transmitter unit.

(A) Normally Open Contact Spring Requirement
    Min 5-1/2 ozs. --- Max 6 ozs.
    To move normally open contact away from stiffener.
    To adjust
    Bend the normally open contact spring to meet requirement.

(B) Normally Open Contact Stiffener Requirement
    Min 0.015 inch --- Max 0.020 inch
    Gap between normally open contacts.
    To adjust
    Bend the contact stiffener to meet requirement.

(C) Swinger Requirement
    It should require
    Min 4 ozs. --- Max 5 ozs.
    To open the normally closed contact.
    To adjust
    Bend the swinger contact to meet requirement.
2.28 Auxiliary No. 1 Contact Assembly (continued)

Secondary Adjustments

NOTE

THE SECONDARY ADJUSTMENTS SHOULD BE MADE WITH THE AUXILIARY CONTACTS INSTALLED.

(A) CONTACT BRACKET

REQUIREMENT

WITH CLUTCH DISENGAGED AND LATCHED, CLEARANCE BETWEEN THE INSULATOR ON THE SWINGER AND THE BAIL
MIN 0.025 INCH --- MAX 0.035 INCH

TO ADJUST
POSITION THE CONTACT BRACKET WITH ITS MOUNTING SCREWS LOOSENED.

(B) CONTACT ASSEMBLY

REQUIREMENT

THE SWINGER INSULATOR SHOULD BE CENTRALLY LOCATED WITH RESPECT TO ITS OPERATING BAIL.

TO ADJUST
LOosen the CONTACT ASSEMBLY SCREws AND POSITION THE SWINGER AND CONTACT SPRINGS.

(C) OPERATING BAIL SPRING

REQUIREMENT

CLUTCH DISENGAGED
MIN 5 OZ
MAX 7 OZ

TO MOVE FOLLOWER ROLLER AWAY FROM LOW PART OF ITS CAM.
2.29 Auxiliary No. 1 Contact Assembly (continued)

Final Adjustment (Strobing)

CONTACT BRACKET

NOTE

A DXD OPERATING AT 600 OPM WITH AN 11 UNIT CODE SCALE SHALL BE USED FOR STROBING.

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LATEST CLOSURE

CODE READING CONTACT TIMING

MIN 625 DIV --- MAX 708 DIV

AUXILIARY NO. 1 CONTACT TIMING

MIN 10 DIV MIN 14 DIV

MIN 590 DIV

EARLIEST OPENING

REQUIREMENT

(1) AUXILIARY NO. 1 CONTACT TRACE SHALL BEGIN A MINIMUM OF 10 DIVISIONS AFTER LATEST CODE READING CONTACT HAS CLOSED, HAVE A MINIMUM PULSE LENGTH OF 590 DIVISIONS, AND END A MINIMUM OF 14 DIVISIONS BEFORE EARLIEST CODE READING CONTACT HAS OPENED.

(2) TRACE MAY HAVE A MAXIMUM OF TWO 2-DIVISION BREAKS WITHIN 8 DIVISIONS OF THE START OR END OF TRACE.

TO ADJUST

LOosen THE CONTACT MOUNTING BRACKET SCREWS AND POSITION BRACKET TO MEET REQUIREMENTS.

NOTE

IF REQUIREMENTS CANNOT BE MET, RE-CHECK INITIAL AND SECONDARY ADJUSTMENTS.
3. VARIABLE FEATURES

3.01 Auxiliary No. 2 Contact Assembly

Initial Adjustments

(A) BREAK-MAKE CONTACT SPRING
   REQUIREMENT
   MIN 4 OZ --- MAX 5 OZ
   TO OPEN NORMALLY CLOSED CONTACTS.
   TO ADJUST
   BEND BREAK-MAKE CONTACT SPRING.

(B) MAKE CONTACT STIFFENER
   REQUIREMENT
   MIN 0.010 INCH --- MAX 0.020 INCH
   GAP BETWEEN NORMALLY OPEN CONTACTS.
   TO ADJUST
   BEND STIFFENER.

(C) MAKE CONTACT SPRING
   REQUIREMENT
   MIN 5-1/2 OZ --- MAX 6 OZ
   TO MOVE MAKE CONTACT SPRING AWAY FROM STIFFENER.
   TO ADJUST
   BEND MAKE CONTACT SPRING.
3.02 Auxiliary No. 2 Contact Assembly (continued)

Secondary Adjustments

(A) CONTACT BRACKET
   TO CHECK
   DISENGAGE AND LATCH CLUTCH.
   REQUIREMENT
   MIN 0.015 INCH --- MAX 0.020 INCH
   CLEARANCE BETWEEN INSULATOR ON BREAK-MAKE CONTACT SPRING AND
   OPERATING SURFACE ON CAM FOLLOWER.
   TO ADJUST
   LOOSEN CONTACT MOUNTING BRACKET SCREWS AND POSITION CONTACT
   ASSEMBLY USING PRY POINT.

(B) CONTACT ASSEMBLY
   TO CHECK
   CLUTCH TRIPPED, ROTATE MAINSHAFT UNTIL INSULATOR ON BREAK-MAKE
   CONTACT SPRING IS IN CONTACT WITH CAM FOLLOWER.
   REQUIREMENT
   INSULATOR ON BREAK-MAKE CONTACT SPRING TO BE CENTRALLY LOCATED
   ON OPERATING Follower EXTENSION AND CONTACTS OF CONTACT
   SPRINGS TO BE ALIGNED.
   TO ADJUST
   LOOSEN CONTACT ASSEMBLY MOUNTING SCREWS AND POSITION CONTACT SPRINGS.

(C) CAM FOLLOWER SPRING
   TO CHECK
   DISENGAGE CLUTCH.
   REQUIREMENT
   MIN 2-1/2 OZ --- MAX 3-1/2 OZ
   TO MOVE CAM FOLLOWER AWAY FROM CAM.
3.03 Auxiliary No. 2 Contact Assembly (continued)

Final Adjustments (Strobing)

CONTACT BRACKET

NOTE

A DXD OPERATING AT 600 OPM WITH AN 11 UNIT CODE SCALE SHALL BE USED FOR STROBING. DISCONNECT ONE END OF THE FILTER NETWORK BEFORE STROBING CONTACTS.

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LATEST CLOSURE

EARLUEST OPENING

CODE READING CONTACT TIMING

MIN 625 DIV --- MAX 708 DIV

AUXILIARY NO. 2 CONTACT TIMING

MIN 296 DIV --- MIN 253 DIV --- SOME CLEARANCE

REQUIREMENT

(1) AUXILIARY NO. 2 CONTACT TRACE SHALL BEGIN A MINIMUM OF 296 DIVISIONS AFTER LATEST CODE READING CONTACT HAS CLOSED, HAVE A MINIMUM PULSE LENGTH OF 253 DIVISIONS AND A MAXIMUM OF 275 DIVISIONS, AND END A MINIMUM OF 21 DIVISIONS BEFORE EARLUEST CODE READING CONTACTS HAVE OPENED.

(2) TRACE MAY HAVE A 2-DIVISION BREAK WITHIN THE FIRST AND LAST 8 SCALE DIVISIONS OF THE TRACE.

TO ADJUST

LOOSEN THE CONTACT MOUNTING BRACKET SCREWS AND POSITION BRACKET TO MEET REQUIREMENTS.

NOTE

IF THE REQUIREMENT CANNOT BE MET, RE-CHECK INITIAL AND SECONDARY ADJUSTMENTS.