**(A) NUMBERING MODULE ADJUSTMENT****(1) REQUIREMENT**

EACH MODULE CENTERED ON ITS TRACK

(2) REQUIREMENT

CONNECTOR PLUG ON EACH MODULE ENGAGES ITS ASSOCIATED RECEPTACLE TO PERMIT QUICK CONNECT-DISCONNECT WITH LEAST INTERFERENCE.

TO ADJUST

(1) REMOVE DRAWER ASSEMBLY FROM CABINET. LOOSEN SHOULDER SCREW THAT GUIDES MODULE AT REAR OF DRAWER. LOOSEN SCREWS THAT MOUNT THE CONNECTOR RECEPTACLE, AND THE SCREWS THAT SECURE THE CONNECTOR BRACKET TO THE DRAWER. MOVE BRACKET TO REARMOST POSITION. INSERT AND CENTER MODULE. MAKE FRONT EDGE OF MODULE PARALLEL AND FLUSH WITH FRONT EDGE OF DRAWER CHANNEL. REMOVE MODULE AND TIGHTEN SHOULDER SCREW. CHECK AND REFINE.

(2) WITH MODULE REINSERTED AND SECURED, POSITION CONNECTOR BRACKET AND CONNECTOR SO RECEPTACLE FULLY ENGAGES PLUG. TIGHTEN BRACKET SCREWS AND THEN RECEPTACLE MOUNTING SCREWS.

(B) CONTROL PANEL ASSEMBLY**REQUIREMENT**

CONTROL PANEL ON DRAWER ASSEMBLY POSITIONED SO NUMERALS ON MODULES ARE CENTRALLY LOCATED WITH RESPECT TO CONTROL PANEL WINDOWS.

TO ADJUST

(1) POSITION PANEL HORIZONTALLY WITH RIGHT AND LEFT BRACKET MOUNTING SCREWS LOOSENED.

(2) POSITION PANEL VERTICALLY WITH MAGNET BRACKET EXTENSION SHOULDER SCREW LOOSENED.

(C) CONTROL PANEL MAGNET ADJUSTMENT**REQUIREMENT**

WHEN CLOSED, CONTROL PANEL EDGES SHOULD BE PARALLEL TO CABINET UPRIGHTS.

TO ADJUST

POSITION MAGNET LATCH ASSEMBLY WITH MOUNTING SCREWS LOOSENED.

Figure 5-107. Universal Cabinet, Control Panel Assembly

1. TANDEM MESSAGE IDENTIFICATION MODULE(A) CODE READING CONTACT ASSEMBLY ADJUSTMENT

NOTE

FOLLOWING ADJUSTMENTS TO BE MADE WITH CONTACT ASSEMBLIES REMOVED FROM MODULE. WHEN USING CONTACT SPRING BENDER, START WITH THE CONTACT PILE-UP FARTHEST FROM HANDLE OF TOOL AND WORK TOWARD CONTACT NEAREST TOOL HANDLE.

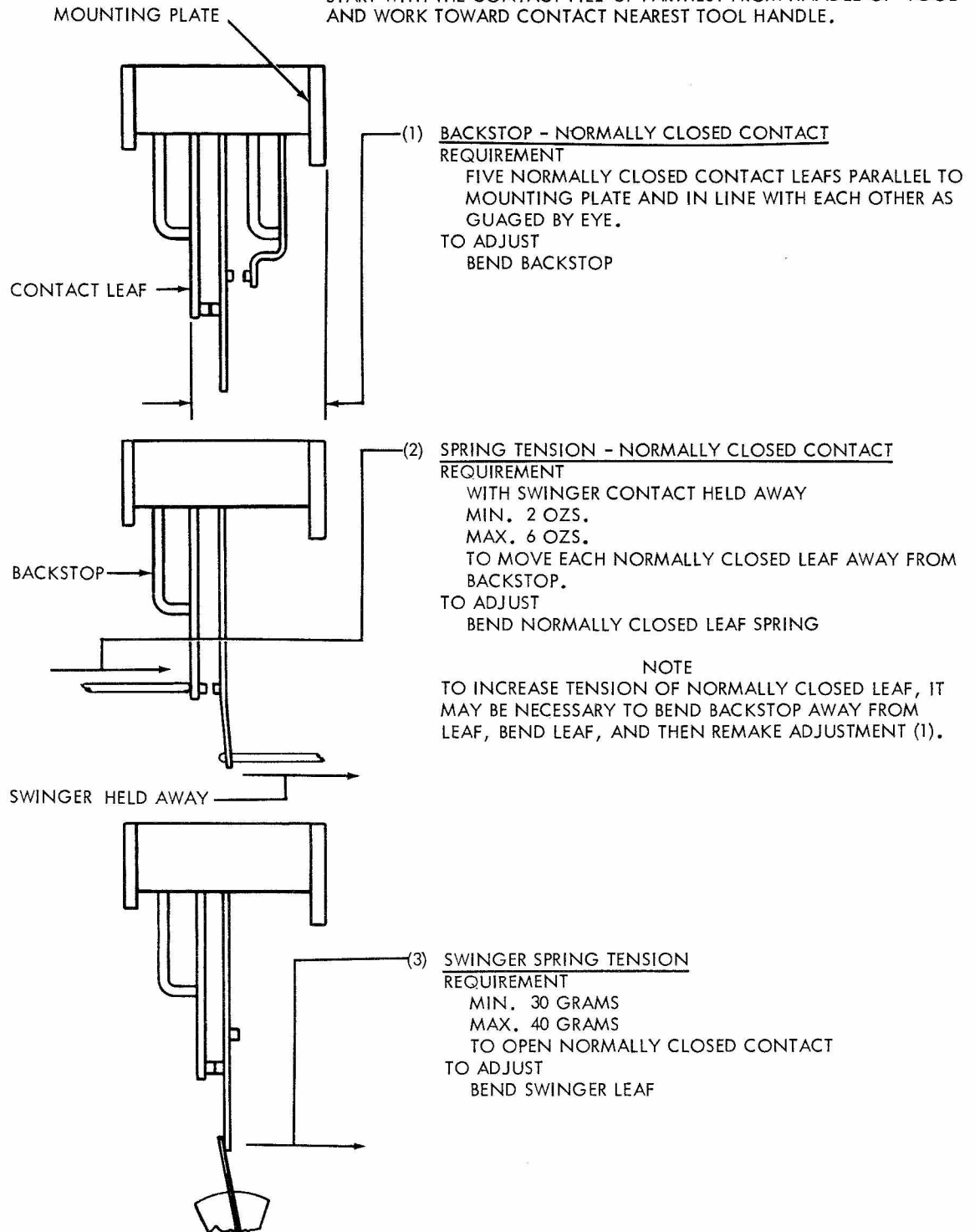
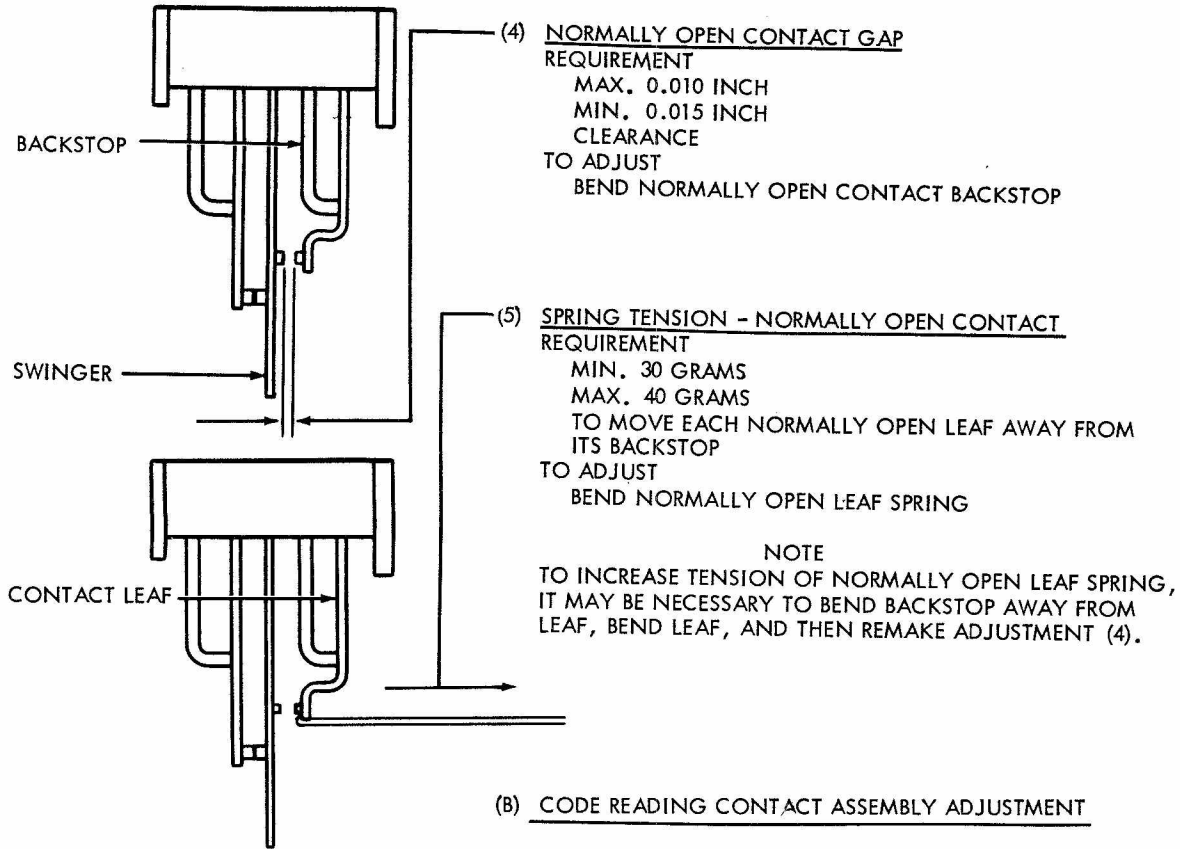


Figure 5-108. Tandem Message Identification Module, Code Reading Contact Assembly



NOTE
 FOLLOWING ADJUSTMENTS TO BE MADE WITH CONTACT ASSEMBLIES MOUNTED ON THEIR BRACKETS, AND PLACED IN THE NUMBERING MODULE. BRACKET SHOULD BE APPROXIMATELY CENTERED IN ITS ADJUSTMENT RANGE.

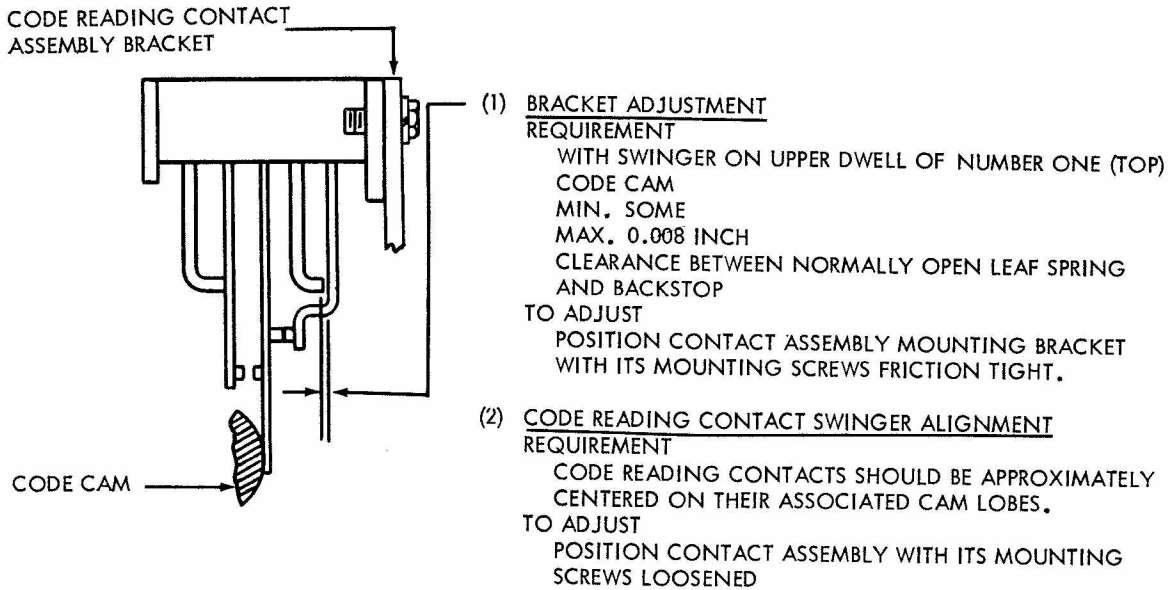


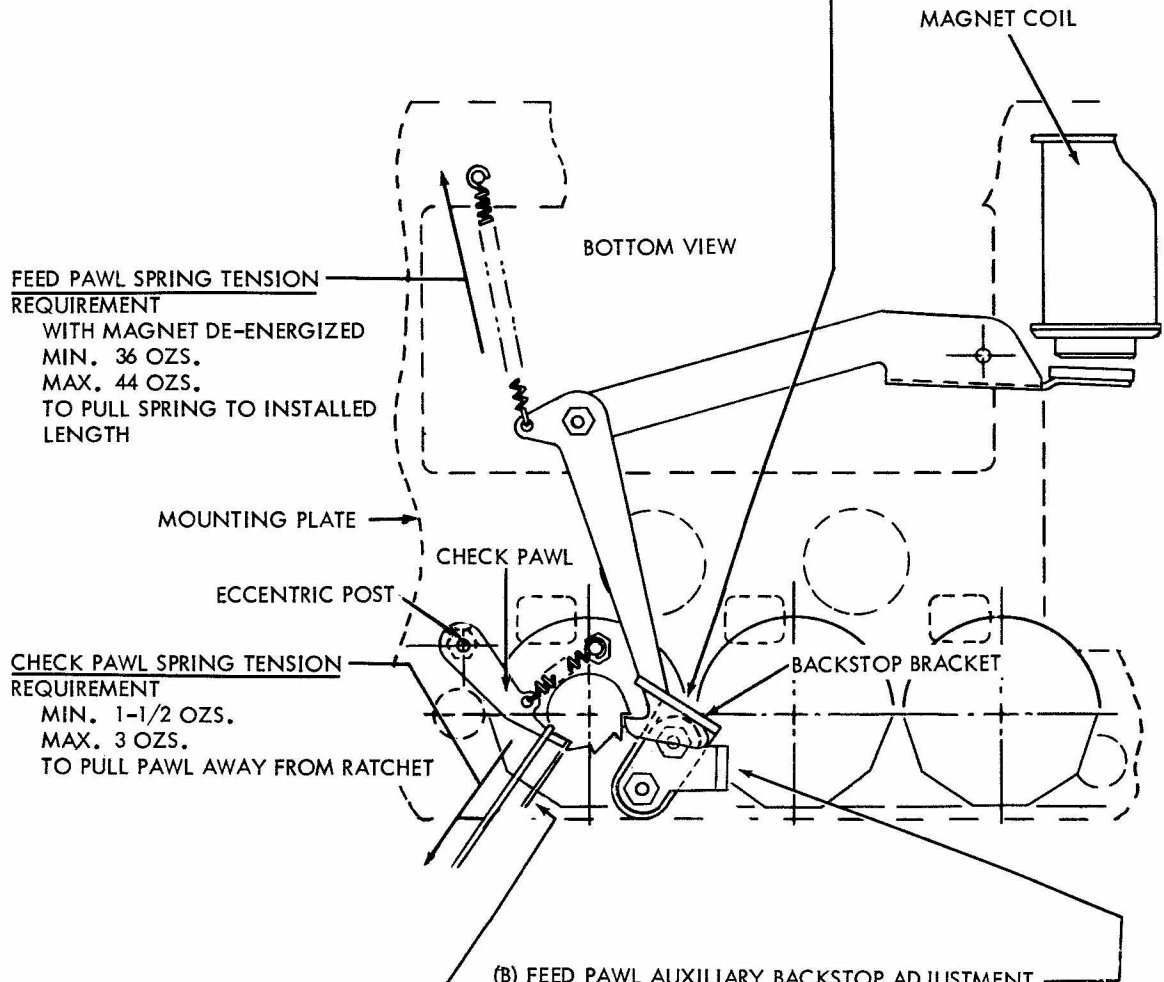
Figure 5-109. Tandem Message Identification Module, Code Reading Contact Assembly

(A) FEED PAWL BACKSTOP ADJUSTMENT**REQUIREMENT**

FLAT OF THE UNITS NUMBER DRUM TO BE PARALLEL TO FRONT EDGE OF TOP PLATE AS GAUGED BY EYE.

TO ADJUST

- (1) LOOSEN SCREW SECURING CHECK PAWL ECCENTRIC POST SO THAT CLEARANCE BETWEEN CHECK PAWL AND RATCHET TOOTH IS MAXIMUM.
- (2) LOOSEN SCREWS SECURING BACKSTOP BRACKET TO ASSEMBLY MOUNTING PLATE. WITH MAGNET DE-ENERGIZED, ADJUST BRACKET TO MEET REQUIREMENT.

**(C) CHECK PAWL ADJUSTMENT****REQUIREMENT**

CLEARANCE BETWEEN END OF CHECK PAWL AND RATCHET TOOTH TO BE
MIN. SOME
MAX. 0.010 INCH
WHEN PLAY IN RATCHET IS TAKEN UP TO MAKE CLEARANCE LEAST.

TO ADJUST

POSITION CHECK PAWL ECCENTRIC POST. CHECK AT SEVERAL PLACES AROUND RATCHET.

(B) FEED PAWL AUXILIARY BACKSTOP ADJUSTMENT**(1) REQUIREMENT**

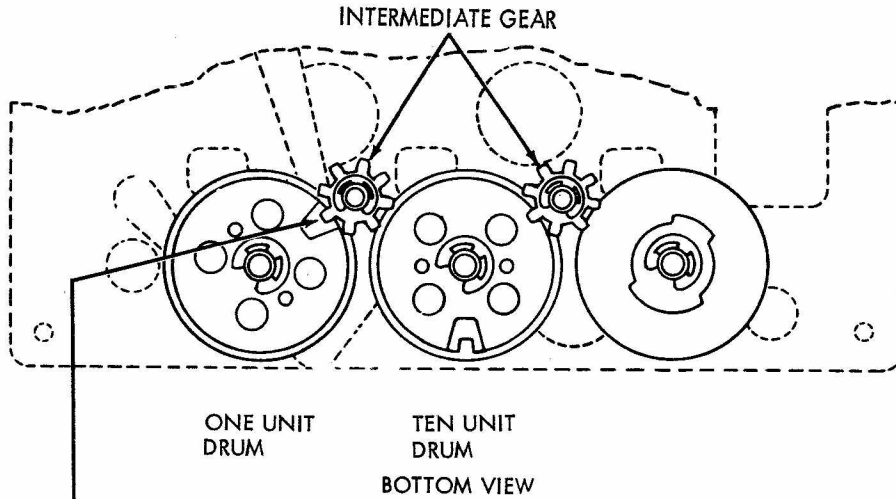
CLEARANCE BETWEEN FEED PAWL AND AUXILIARY STOP BRACKET TO BE
MIN. 0.020 INCH
MAX. 0.025 INCH
WHEN FEED PAWL IS AGAINST RATCHET TOOTH ALLOWING LEAST CLEARANCE.

(2) WHEN MANUALLY OPERATED, FEED PAWL SHOULD NOT TOUCH AUXILIARY BACKSTOP

TO ADJUST

POSITION THE AUXILIARY BACKSTOP WITH ITS MOUNTING SCREWS LOOSENED.

Figure 5-110. Tandem Message Identification Module, Feed and Check Pawls



INTERMEDIATE GEAR ADJUSTMENT

(1) REQUIREMENT

BARELY PERCEPTIBLE BACKLASH BETWEEN INTERMEDIATE GEAR TOOTH AND DISK ASSEMBLY TOOTH WHEN DISK IS HELD IN MIDDLE OF STEP. CHECK "UNIT" AND "TEN" DRUMS.

(2) REQUIREMENT

BARELY PERCEPTIBLE BACKLASH BETWEEN SPUR GEAR AND 20 TEETH GEAR AT POSITION OF MINIMUM CLEARANCE.
TO ADJUST POSITION SPUR GEAR WITH ITS MOUNTING NUT LOOSENED.

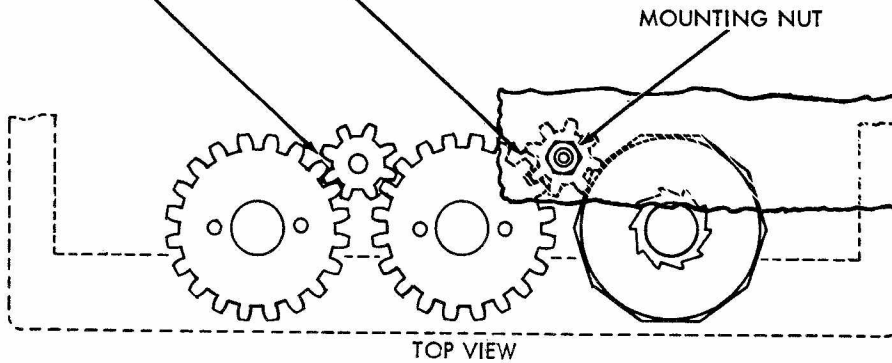


Figure 5-111. Tandem Message Identification Module, Intermediate Gear

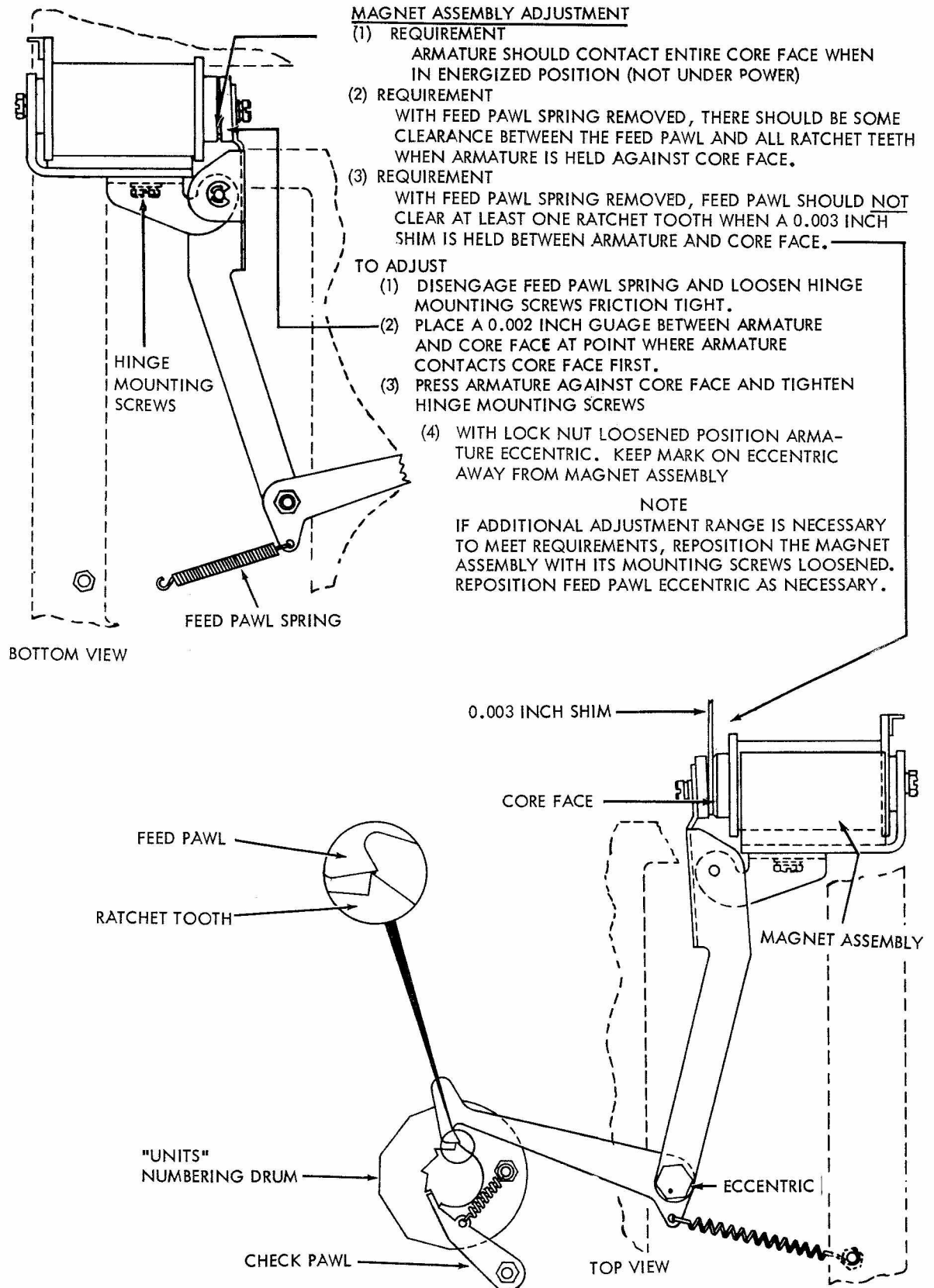


Figure 5-112. Tandem Message Identification Module, Magnet Assembly

NOTE

ADJUSTMENTS ON THE RELAYS AND THE STEPPING SWITCH WILL NOT BE REQUIRED UNDER NORMAL CONDITIONS. IN EMERGENCY CASES, WHEN A REPLACEMENT IS NOT AVAILABLE OR DURING A MAJOR OVERHAUL, ADJUSTMENTS SHOULD BE MADE ONLY BY QUALIFIED PERSONNEL.

BRUSH SPRING TENSION

(1) REQUIREMENT

BRUSH SPRINGS SHOULD REST AGAINST THE INNER HUB OF WIPER CONTACTS WITH ENOUGH TENSION TO INSURE GOOD ELECTRICAL CONTACT.

NOTE

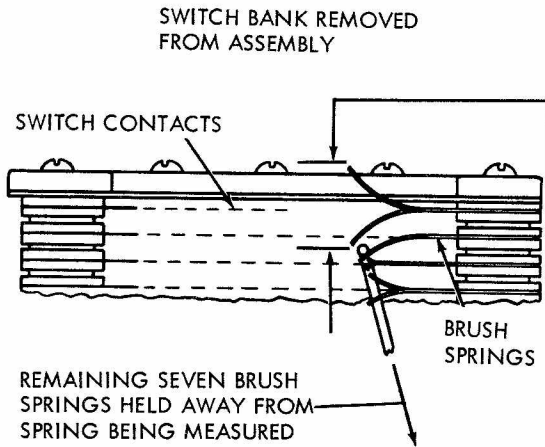
UNDER NORMAL CONDITIONS THE BRUSH SPRINGS WILL NOT REQUIRE ADJUSTMENT DURING THE LIFE OF THE SWITCH. IF ADJUSTMENT IS NECESSARY, PROCEED AS FOLLOWS:

(2) REQUIREMENT

WITH SWITCH ASSEMBLY REMOVED FROM BANK, TENSION AND CURVE BRUSH SPRINGS TO OBTAIN A MINIMUM 1/2 INCH SEPARATION OF THE ENDS. TO ADJUST LOOSEN TWO BANK MOUNTING SCREWS AND REMOVE SWITCH ASSEMBLY. BEND BRUSH SPRINGS AS REQUIRED. REPLACE SWITCH ASSEMBLY.

CAUTION

USE EXTREME CARE WHEN REASSEMBLING THE SWITCH TO AVOID DAMAGE TO THE BRUSHES AND WIPERS.



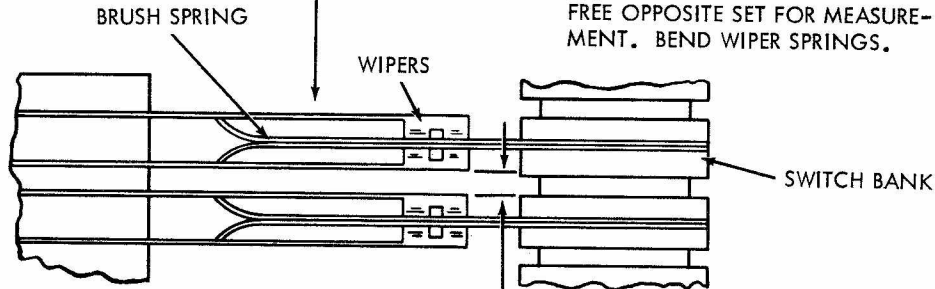
WIPER SPRING ALIGNMENT AND TENSION

(1) REQUIREMENT

WIPERS SHOULD HAVE SUFFICIENT TENSION TO INSURE GOOD ELECTRICAL CONTACT WITH SWITCH BANK CONTACTS. TO ADJUST BEND WIPER SPRINGS

(2) REQUIREMENT

EACH SPRING OF A WIPER PAIR SHOULD HAVE SUFFICIENT TENSION TO FOLLOW ITS OPPOSING SPRING 0.094 INCH WHEN ITS OPPOSING SPRING IS DEFLECTED. TO ADJUST POSITION ONE SET OF WIPERS ON FIFTH SWITCH CONTACTS TO FREE OPPOSITE SET FOR MEASUREMENT. BEND WIPER SPRINGS.



(3) REQUIREMENT

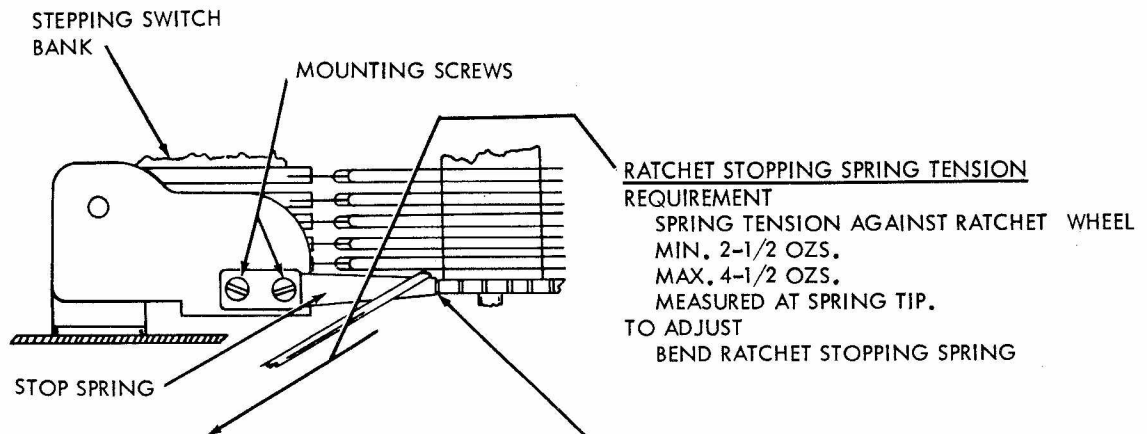
ALIGN WIPER PAIRS SO THEY PASS ONTO BASE OF BRUSH SPRINGS WITHOUT EXCESSIVE MOVEMENT (0.015 INCH) TO ONE SIDE OR THE OTHER.

(4) REQUIREMENT

CLEARANCE BETWEEN WIPER SPRINGS OF ADJACENT WIPER PAIRS MINIMUM 0.062 INCH WITH WIPERS RESTING ON BANK CONTACTS TO ADJUST BEND WIPER SPRINGS

VIEWED FROM RIGHT SIDE OF MODULE

Figure 5-113. Tandem Message Identification Module, Stepping Switch Assembly



RATCHET STOPPING SPRING ALIGNMENT REQUIREMENT

WITH PLAY BETWEEN FEED PAWL AND RATCHET WHEEL TAKEN UP IN CLOCKWISE DIRECTION
 MIN. SOME
 MAX. 0.003 INCH
 CLEARANCE BETWEEN SPRING TIP AND RADIAL SURFACE OF RATCHET TOOTH.
 TO ADJUST
 POSITION SPRING WITH MOUNTING SCREWS LOOSENED.

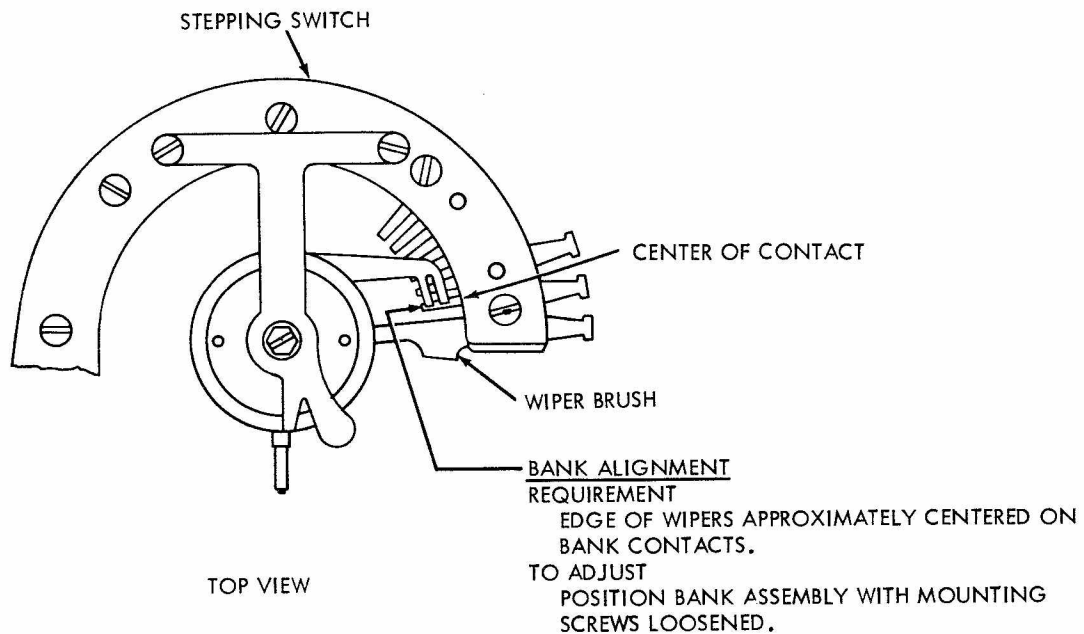
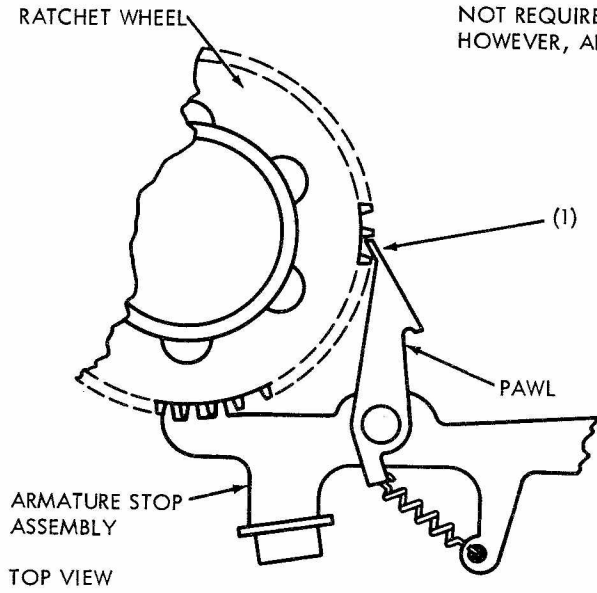


Figure 5-114. Tandem Message Identification Module, Stepping Switch Assembly

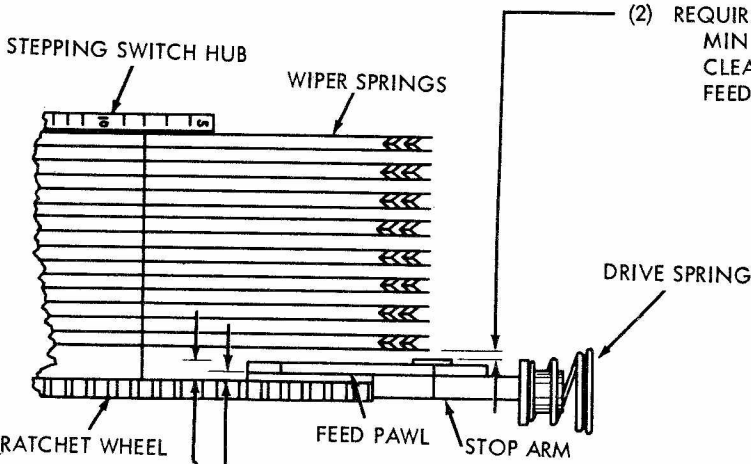
(A) ARMATURE ASSEMBLY ALIGNMENT

NOTE

UNDER NORMAL CONDITIONS THE ARMATURE ASSEMBLY SHOULD NOT REQUIRE ADJUSTMENT DURING THE LIFE OF THE SWITCH. IF, HOWEVER, ADJUSTMENT IS NECESSARY PROCEED AS FOLLOWS:



(1) REQUIREMENT
 EDGES OF FEED PAWL SHOULD BE PARALLEL TO RATCHET WHEEL SIDE AND TOP OF FEED PAWL SHOULD BE PARALLEL TO EDGE OF RATCHET TEETH, GAUGE BY EYE.



(2) REQUIREMENT
 MIN. 0.031 INCH
 CLEARANCE BETWEEN WIPER SPRINGS AND FEED PAWL

(4) REQUIREMENT
 HORIZONTAL EDGE OF FEED PAWL TO PROJECT
 MIN. 0.015 INCH
 MAX. 0.094 INCH
 ABOVE HORIZONTAL SURFACE OF RATCHET GEAR IS ALLOWED BY ARMATURE AND PAWL BEARING PLAY

(3) REQUIREMENT
 HORIZONTAL SURFACE OF ARMATURE STOPPING TEETH TO PROJECT ABOVE OR BELOW HORIZONTAL SURFACE OF RATCHET GEAR
 MIN. 0 INCH
 MAX. 0.010 INCH

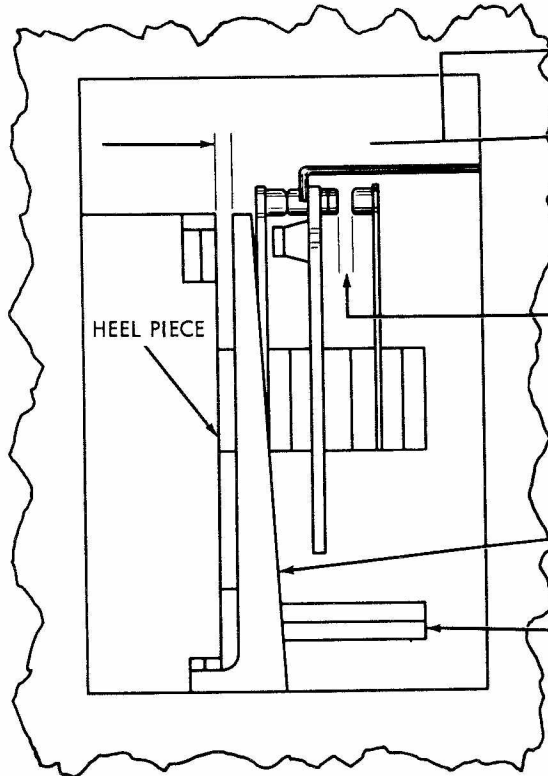
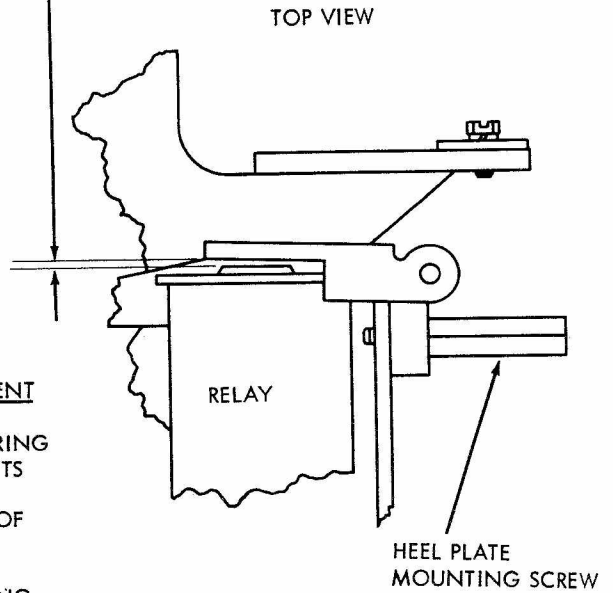
Figure 5-115. Tandem Message Identification Module, Stepping Switch Assembly

(5) REQUIREMENT
 AIRLINE CLEARANCE
 MIN. 0.003 INCH
 MAX. 0.015 INCH
 WITH ARMATURE ELECTRICALLY OPERATED

(6) REQUIREMENT
 ARMATURE SHOULD CLEAR, AND BE PARALLEL
 TO HEEL PIECE AS GAUGED BY EYE.
 TO ADJUST
 POSITION ARMATURE ASSEMBLY WITH HEEL
 MOUNTING SCREWS LOOSENED.

(B) INTERRUPTER ADJUSTMENTS

(1) INTERRUPTER SWINGER AND CONTACT ALIGNMENT
 REQUIREMENT
 ARMATURE ARM TO STRIKE SWINGER LEVER SPRING
 BUSHING CENTRALLY. INTERRUPTER CONTACTS
 TO BE ALIGNED WITHIN 1/5 OF THEIR FACE
 DIAMETER, AND MAKE CONTACT AT CENTER OF
 THEIR FACES.
 TO ADJUST
 POSITION INTERRUPTER CONTACTS WITH SPRING
 ASSEMBLY MOUNTING SCREWS LOOSENED.



(3) INTERRUPTER SWINGER TENSION
 REQUIREMENT
 MIN. 9-1/2 OZS.
 MAX. 14 OZS.
 TO JUST SEPARATE SWINGER FROM NORMALLY
 CLOSED CONTACT.
 TO ADJUST
 BEND SWINGER. RECHECK (2).

(2) INTERRUPTER CONTACT GAP
 REQUIREMENT
 GAPS BETWEEN NORMALLY CLOSED CONTACT
 AND SWINGER, AND NORMALLY OPEN CONTACT
 AND SWINGER
 MIN. 0.008 INCH
 TO ADJUST
 BEND CONTACT SPRINGS

INTERRUPTER SWITCH ASSEMBLY BOTTOM VIEW

Figure 5-116. Tandem Message Identification Module, Stepping Switch Assembly

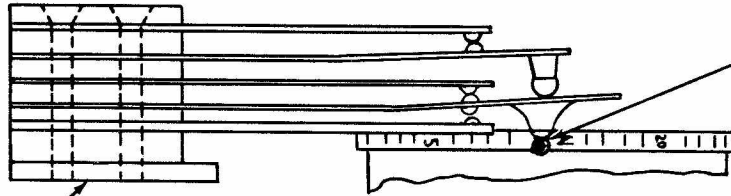
(A) OFF-NORMAL SWINGER ALIGNMENT

(1) REQUIREMENT

APEX OF "V" FORM ON LOWER SWINGER APPROXIMATELY CENTERED ON OFF-NORMAL ARM ACTUATING BUSHING WHEN SWITCH IS ON 26TH STEP.

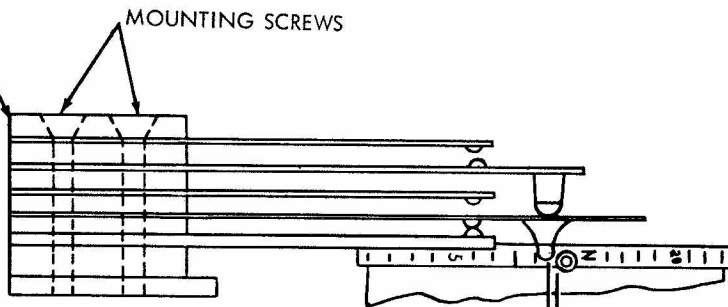
(2) REQUIREMENT

EITHER EDGE OF "V" FORM
MIN. 1/32 INCH
FROM EDGES OF ACTUATING BUSHING



HOME POSITION (26TH STEP)

OFF-NORMAL CONTACT ASSEMBLY



1ST POSITION

(3) REQUIREMENT

CLEARANCE BETWEEN "V" FORM AND ACTUATING BUSHING
MIN. 0.010 INCH
WHEN SWITCH IS ON 25TH OR 1ST STEP AND WIPER
ASSEMBLY PLAY IS TAKEN UP IN THE CLOCKWISE
DIRECTION.

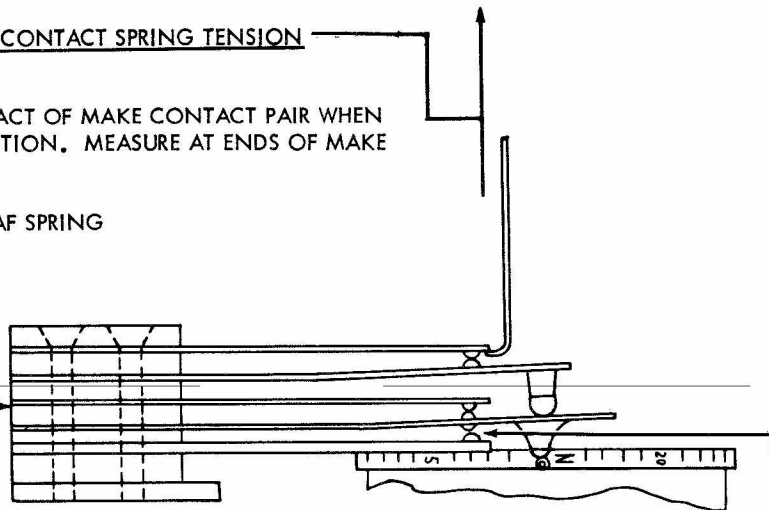
TO ADJUST

POSITION OFF-NORMAL SWITCH ASSEMBLY WITH
MOUNTING SCREWS LOOSENED.

Figure 5-117. Tandem Message Identification Module, Stepping Switch Assembly

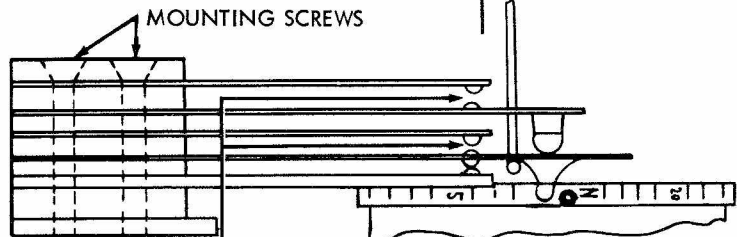
- (D) OFF-NORMAL SWITCH MAKE CONTACT SPRING TENSION
 REQUIREMENT
 MIN. 0.015 GRAMS
 TO SEPARATE EACH CONTACT OF MAKE CONTACT PAIR WHEN SWITCH IS ON HOME POSITION. MEASURE AT ENDS OF MAKE CONTACT SPRING LEAF
 TO ADJUST
 BEND MAKE CONTACT LEAF SPRING

OFF-NORMAL CONTACT ASSEMBLY



HOME POSITION (26TH STEP)

- (C) OFF-NORMAL SWITCH BREAK CONTACT SPRING TENSION
 REQUIREMENT
 MIN. 30 GRAMS
 MAX. 50 GRAMS
 TO START LOWER SWINGER CONTACTS MOVING AWAY FROM BREAK CONTACT WHEN SWITCH IS OFF HOME POSITION. MEASURE AT POINT BETWEEN "V" AND CONTACT, NEAREST TO "V".
 TO ADJUST
 BEND SWINGER



MOUNTING SCREWS

- (B) OFF-NORMAL SWITCH BREAK AND MAKE CONTACT GAPS
 NOTE
 BREAK COMBINATIONS ARE THOSE WHICH ARE OPEN WHEN SWITCH IS IN HOME POSITION. MAKE COMBINATIONS ARE THOSE WHICH ARE CLOSED WHEN SWITCH IS IN HOME POSITION.

- (1) REQUIREMENT
 BREAK CONTACT SEPARATION
 MIN. 0.008 INCH
 WHEN SWITCH IS ON HOME POSITION.
 TO ADJUST
 BEND BREAK CONTACT SPRING LEAF
- (2) REQUIREMENT
 MAKE CONTACT SEPARATION
 MIN. 0.008 INCH
 WHEN SWITCH IS OFF HOME POSITION
 TO ADJUST
 BEND MAKE CONTACT SPRING LEAF

Figure 5-118. Tandem Message Identification Module, Stepping Switch Assembly

5-3. LUBRICATION

a. GENERAL

(1) This section provides lubrication information for the Model 28 Teletype equipment contained in this manual. On the following pages the general areas of the equipment are shown by photographs. The specific points to receive lubricant are indicated by line drawings and descriptive text. The symbols in the text indicate the following directions:

- O Apply one drop of oil.
- O2 Apply two drops of oil.
- O3 Apply three drops of oil, etc.
- G Apply thin coat of grease.
- SAT Saturate with oil (felt washers, etc.)
- L Apply Lubriplate

Teletype KS7470 oil and KS7471 grease should be used.

(2) The equipment should be thoroughly lubricated, but over-lubrication which might allow oil to drop or grease to be thrown on other parts should be avoided. Special care

should be exercised to prevent lubricant from getting between armatures and pole faces or between electrical contact points. The following general instructions supplement the specific lubricating points illustrated on subsequent pages:

- Apply one drop of oil to all springs hooks.
- Apply a light film of oil to all cam surfaces.
- Apply a thick coat of grease to all gears.
- Saturate all felt washers, oilers, etc.
- Apply oil to all pivot points.
- Apply oil to all sliding surfaces.

(3) All equipment should be lubricated before being placed in service or prior to storage. After a few weeks of service, relubricate to make certain that all specified points have received lubricant. Thereafter, the following schedule should be adhered to:

<u>Operating Speed</u>	<u>Lubrication Interval</u>
60 WPM	3000 hours or 1 year*
100 WPM	1500 hours or 6 months*

*Whichever occurs first.

e. TANDEM MESSAGE IDENTIFICATION MODULE

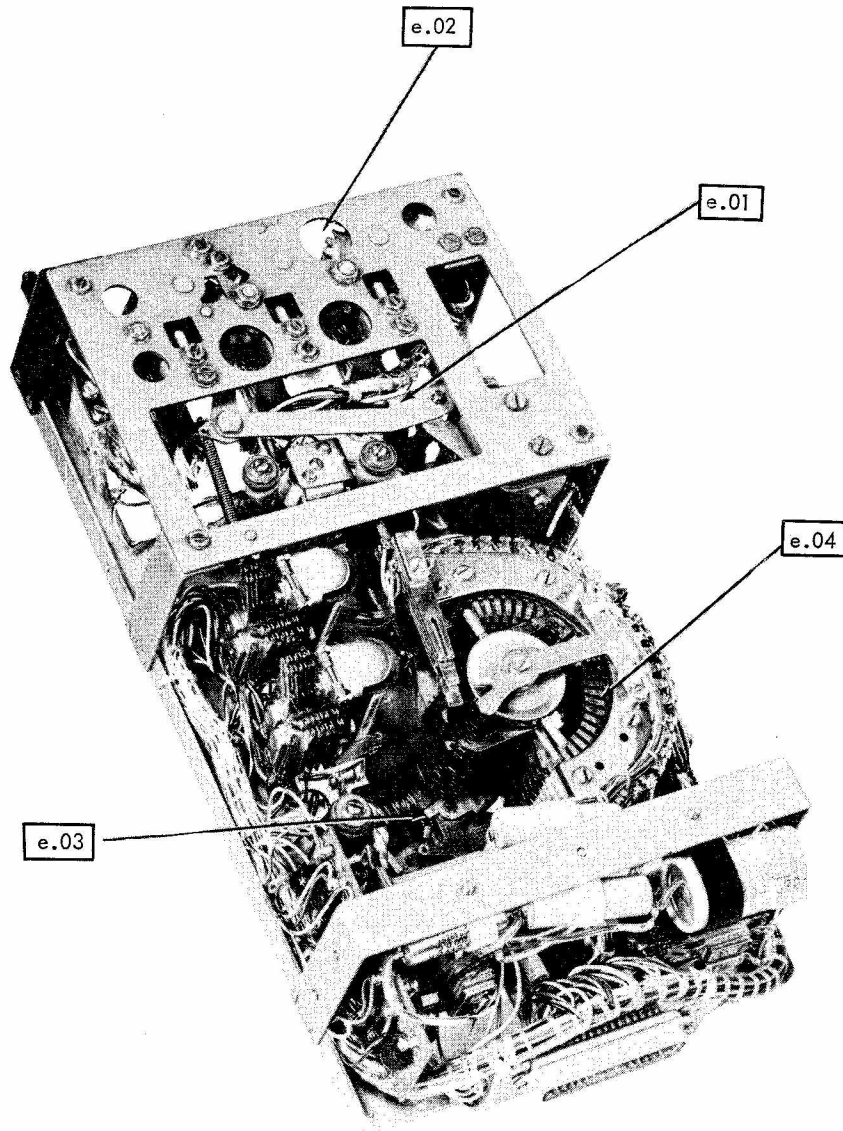
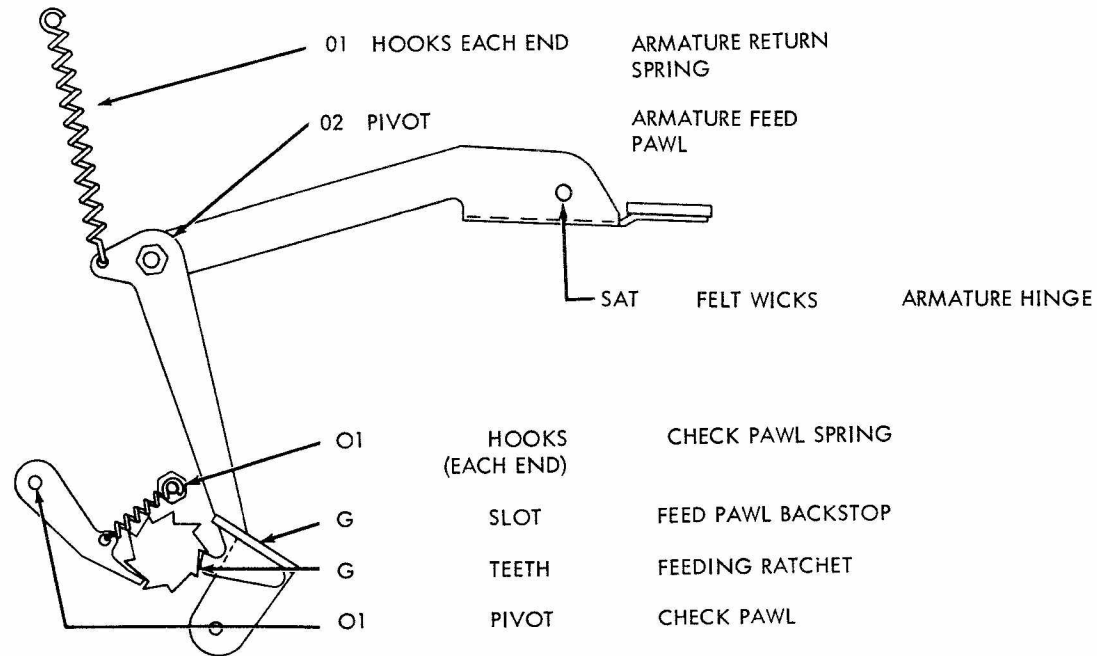


Figure 5-149. Tandem Message Identification Module

e.01 NUMBER ADVANCE MECHANISM



e.02 COUNTER DRUM ASSEMBLY

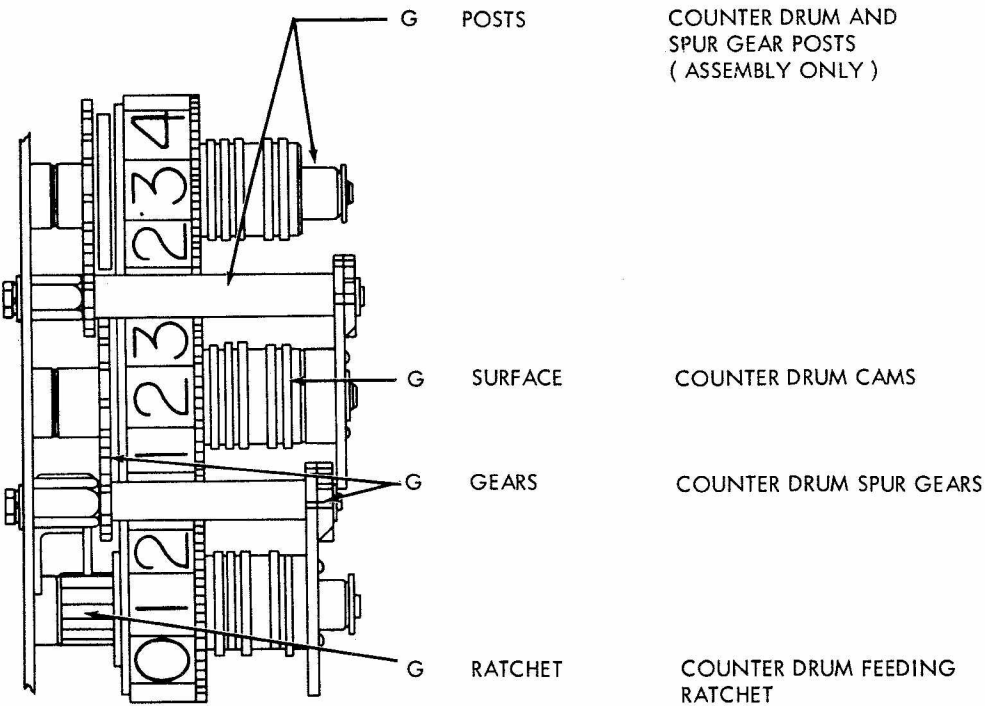
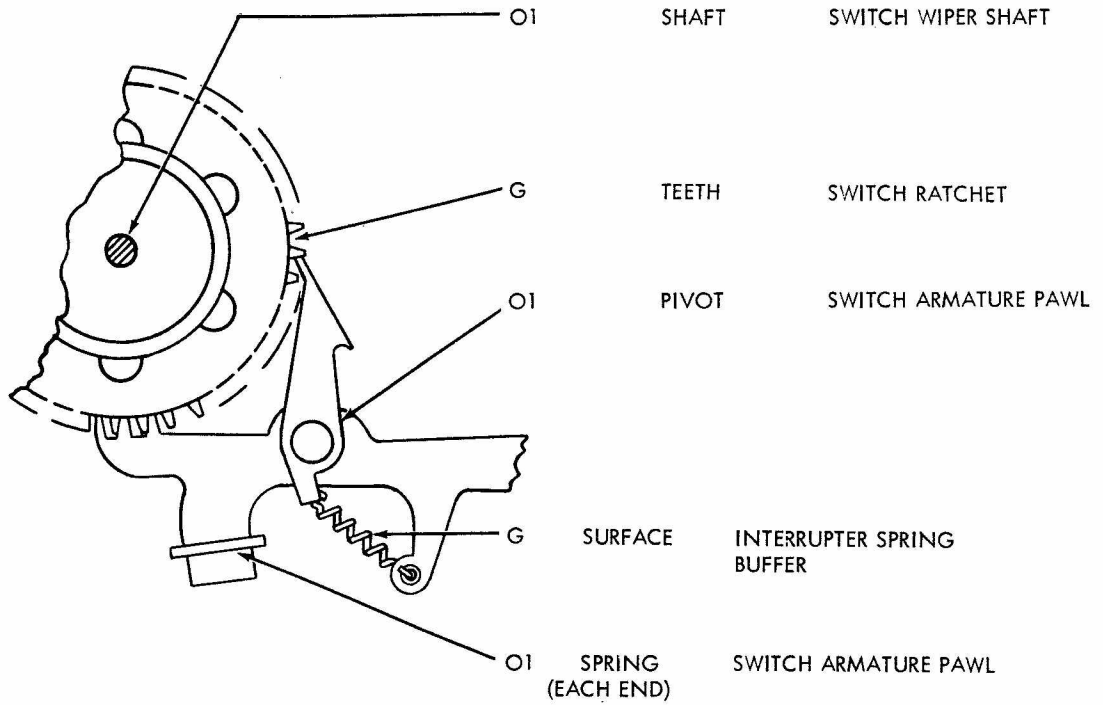


Figure 5-150. Tandem Message Identification Module

e.03 STEPPING SWITCH FEED MECHANISM



e.04 STEPPING SWITCH ELECTRICAL CONTACTS

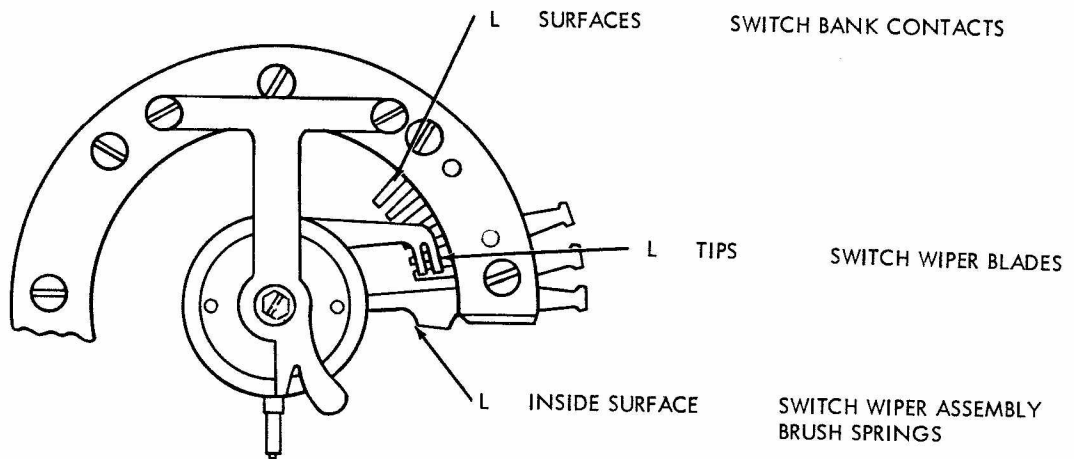


Figure 5-151. Tandem Message Identification Module