24-HOUR TIMER

ADUSTMENTS

CONTENTS PAGE

1. GENERAL

1.01 This section provides adjustment requirements for the 24-hour timer (Figures 1 and 2). It is reissued to add engineering changes, information on gold-plated contacts, and to provide coverage of the eight-level timer equipped with even parity. Since this is a general revision, marginal arrows ordinarily used to indicate changes and additions have been omitted.

1.02 The adjustments are arranged in a sequence which would be followed if a complete readjustment of a unit were undertaken. Read a procedure all the way through before making the adjustment or checking a spring tension. If an adjustment is made, related adjustments should be checked.

1.03 Most adjustments require removal of the timer from its mounting bracket and disconnecting the ac power supply. Be sure to reset the timer when reinstalling it, or at any time it has been necessary to disconnect the power.

1.04 Location of clearances, position of parts, and point and angle of scale applications are illustrated. Requirements and procedures are set forth in text accompanying the illustrations.

1.05 Spring tensions given in this specification are indications, not exact values, and should be checked with scales in the positions shown in the drawings. Springs which do not meet the requirements and for which there are no adjusting procedures, should be discarded and replaced by new springs.

2.03 Driving Bail Bracket

DRIVING BAIL BRACKET

Requirement

(1) Feed pawls in alignment and full engagement with ratchet teeth.

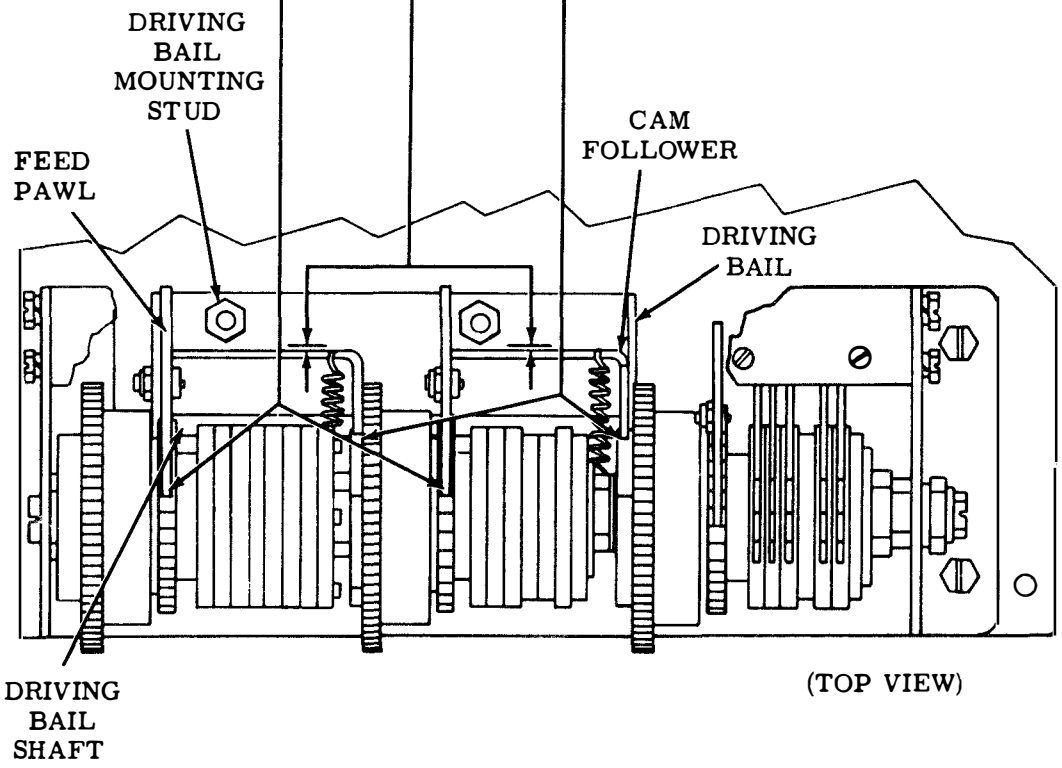
(2) Driving bail cam followers fully engage their respective cams.

(3) With cam follower on high part of cam, each driving bail should clear mounting stud by:

Min 0.007 inch

To Adjust

Position driving bail with mounting studs friction tight for requirements (1) and (2). Tighten studs. Refine tightness to meet requirement (3).



(TOP VIEW)

2.04 Drive Shaft Cam and Bearing Bracket

MOTOR DRIVE SHAFT CAM AND BEARING BRACKET POSITION

Requirement

(1) Drive cam shaft should turn freely and pass through center of motor bracket clearance hole.

(2) When clearance in drive cam and shaft assembly is taken up in direction of least bearing engagement, shaft should turn freely and bearing area of shaft should fully engage bearing bracket.

To Adjust

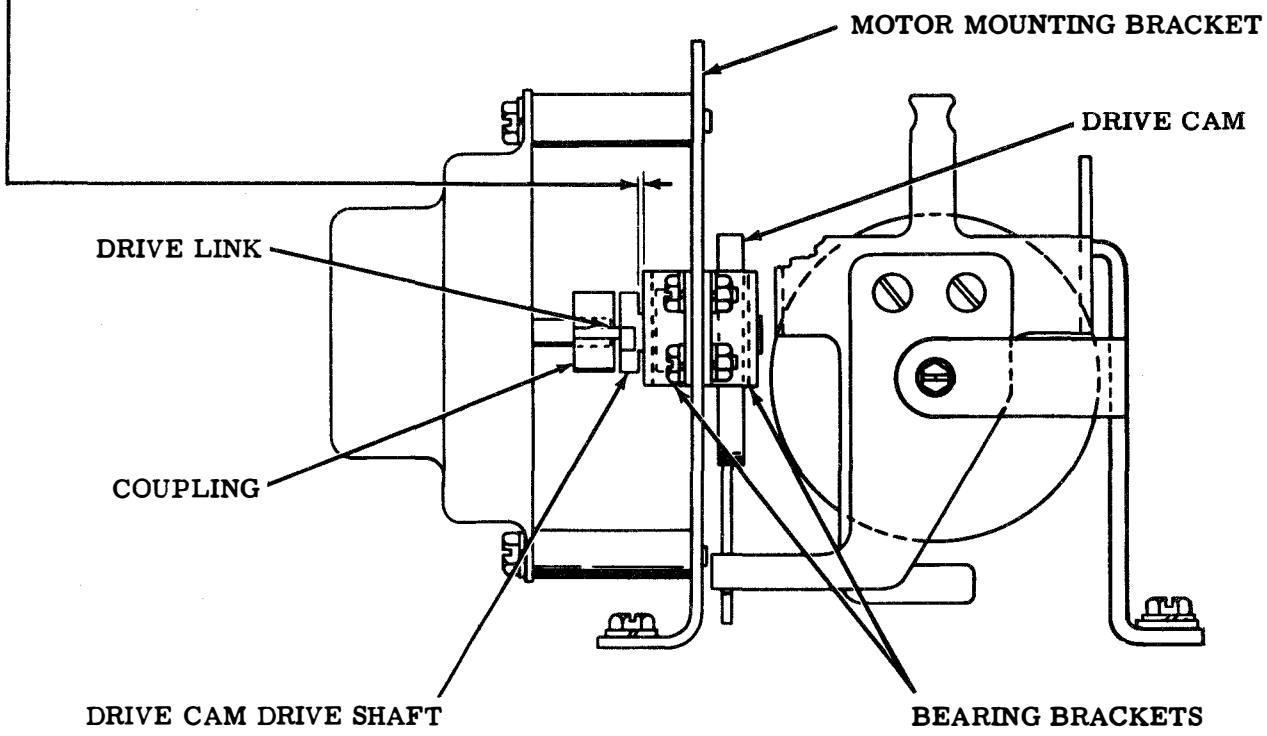
(1) Release driving lever spring. Remove motor. With two bearing bracket mounting screws friction tight and drive cam on its shaft, position bearing brackets to meet requirement (1). Gauge by eye. Tighten bearing bracket mounting screws.

(2) With drive cam set screw loosened and a 0.002 to 0.010 inch gap between drive shaft hub and bearing bracket on motor side, center drive cam between two bearing brackets. Gauge by eye. Tighten drive cam set screw.

Motor Re-Installation

(1) Place coupling on motor shaft. Shaft end is flush with coupling face as gauged by eye. Tighten coupling set screw on flat of motor shaft.

(2) Engage fork of drive link with motor shaft coupling and drive cam shaft. Mount motor to motor mounting bracket. Drive cam shaft and motor shaft coupling should be concentric as gauged by eye. Tighten screws. Replace driving lever spring.



2.05 Driving Lever Bracket

DRIVING LEVER BRACKET

Requirement

(1) With play in magnet coil bracket taken up toward the left (as viewed from front of unit) there shall be approximately 1/16 inch clearance between coil surface and adjacent bearing bracket keeping edge of foot on motor mounting bracket parallel to edge of base as gauged by eye.

(2) Feed pawl pushing face lined up with ratchet wheel.

(3) With shaft play taken up to a minimum, camming arm of driving lever fully engages motor shaft cam and clears motor mounting screw and bracket by

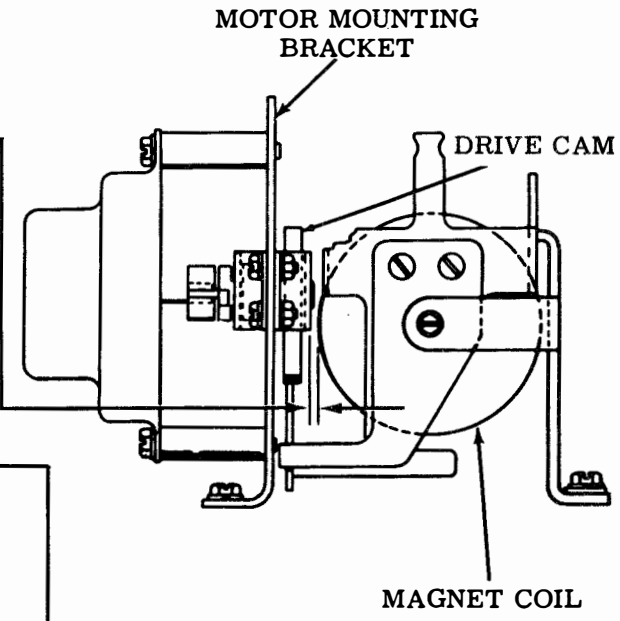
Min 0.030 inch

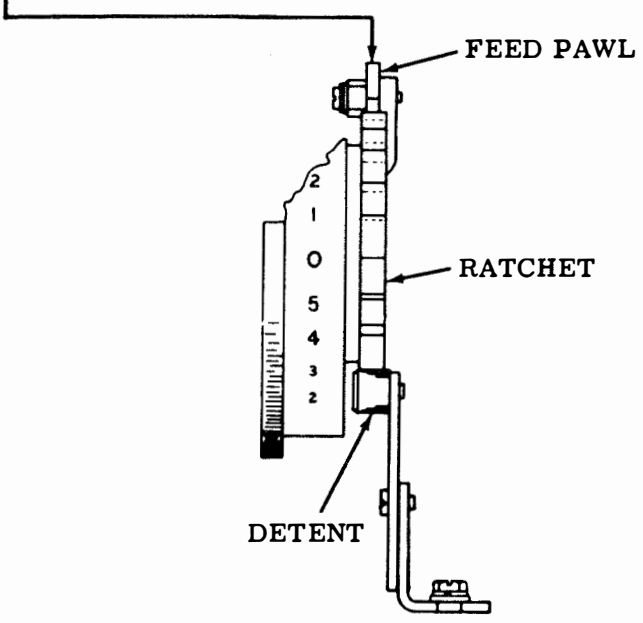
To Adjust

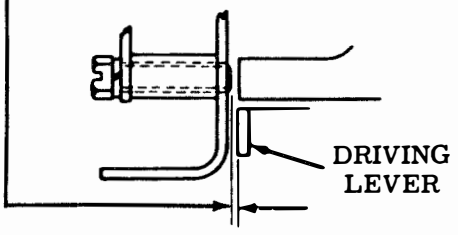
(1) With mounting screws loosened, position motor mounting bracket toward the right to meet requirement.

(2) Disconnect driving lever spring. With mounting screws friction tight, position bracket.

(3) Loosen motor shaft set screw to position cam, taking up shaft play to minimum. Tighten set screw to flat of motor shaft.







(REAR VIEW)

2.06 Driving Bail and Driving Bail Lever

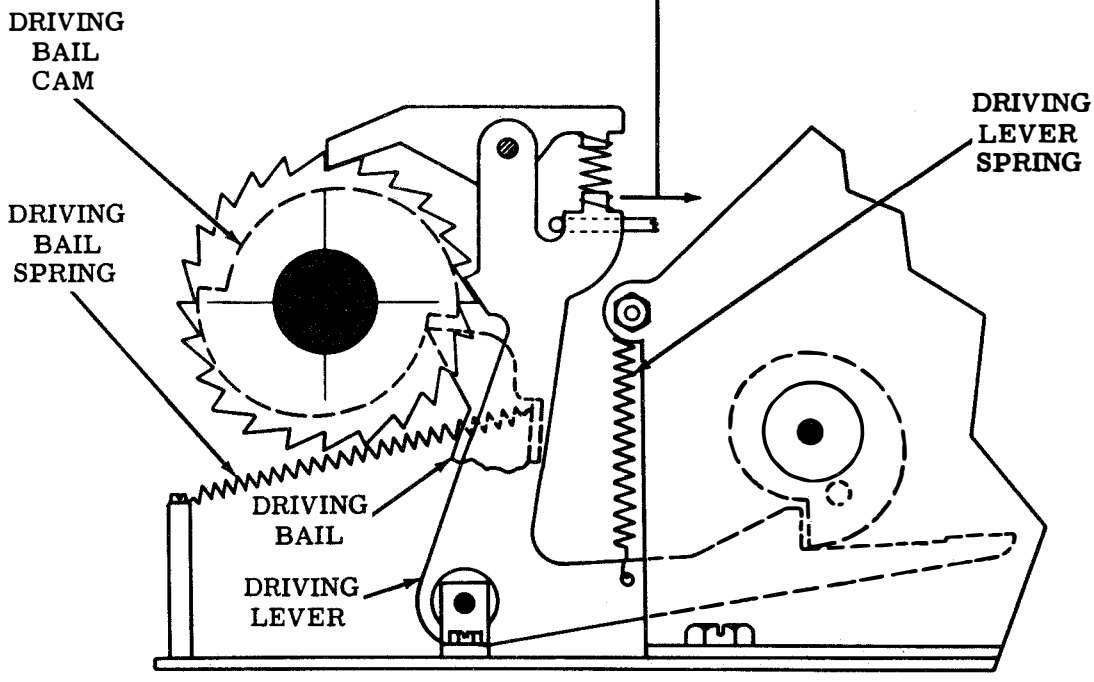
DRIVING BAIL AND DRIVING BAIL LEVER SPRING TENSIONS

Requirement

Bail or lever cam follower on lowest part of cam.

	HOUR DRIVING BAIL	TENS OF MINUTES DRIVING BAIL	MINUTES LEVER
Min	12 ozs	22 ozs	30 ozs
Max	16 ozs	30 ozs	40 ozs

(RIGHT SIDE VIEW)



2.07 Detent Assembly

DETENT ROLLER BRACKET

Requirement (Each Detent)

One or more contact cam riders centered between any cam drop and cam rise which are separated by only one ratchet tooth spacing.

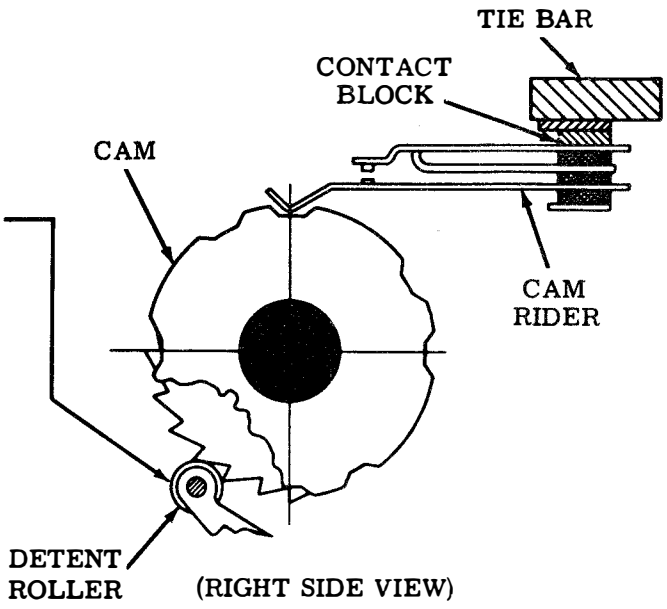
(1) Detent roller fully seated in ratchet tooth.

(2) Clearance between detent roller stud and number drum:

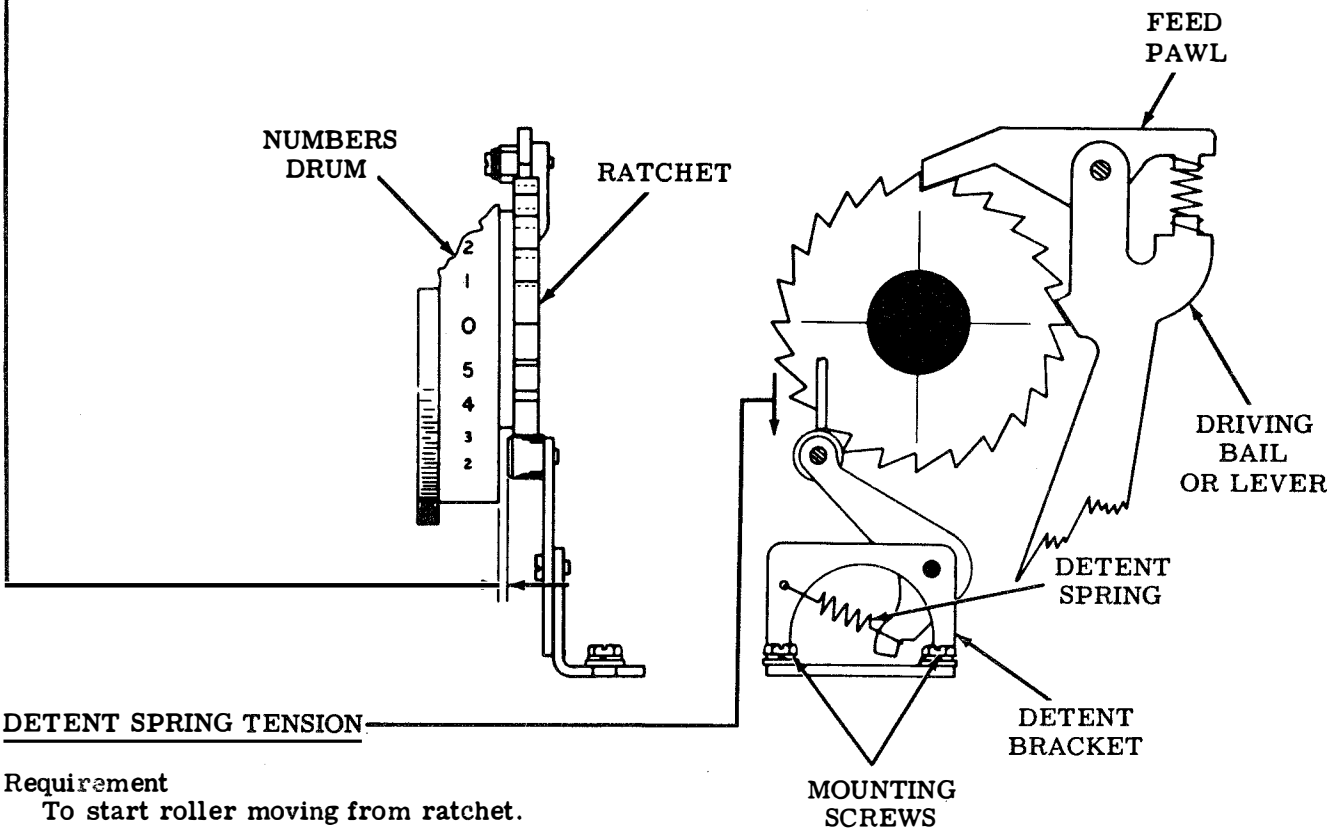
Min 0.005 inch

To Adjust

Position bracket with mounting screws friction tight. Use rocking motion of cam assembly to find center position of cam rider.



(RIGHT SIDE VIEW)



(RIGHT SIDE VIEW)

DETENT SPRING TENSION

Requirement

To start roller moving from ratchet.

	HOUR DETENT	TENS OF MINUTES DETENT	MINUTES DETENT
Min	4 ozs	9 ozs	12 ozs
Max	6 ozs	11 ozs	20 ozs

2.08 Feed Pawl

FEED PAWL POSITION

Requirement (Each Pawl)

Check each pawl with driving lever on low part of cam. (Energize motor to allow driving lever to reach low part of tenths cam. Set other two cams manually.) With detent held fully seated in ratchet tooth, adjust feed pawl to provide zero clearance between feed pawl pushing face and ratchet tooth face.

To Adjust

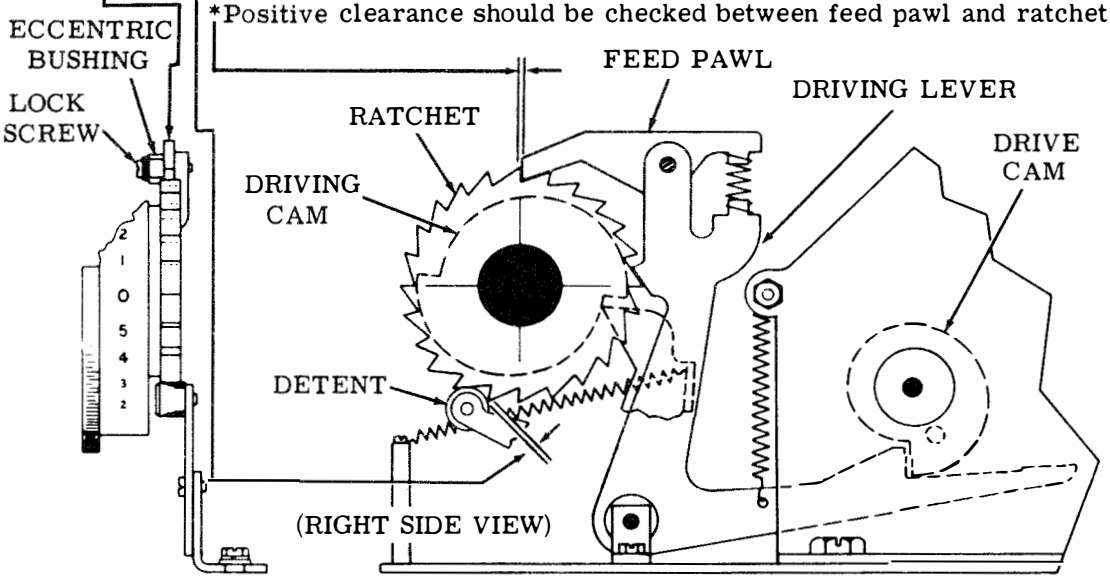
Position eccentric bushing with lock screw friction tight. High side of eccentric is toward base. Tighten lock screw.

To Check

For other positions (every 90 degrees) of ratchet wheel, permissible clearance between feed pawl and ratchet tooth should not exceed:

Min 0.000 inch---Max ±0.005 inch*

*Negative clearance should be checked between detent roller and ratchet tooth.
*Positive clearance should be checked between feed pawl and ratchet tooth.



CAUTION: TURN RATCHET WHEEL THROUGH ONE COMPLETE REVOLUTION TO ASSURE THAT FEED PAWL ADVANCES RATCHET WHEEL. FEED PAWL MUST DROP OFF RATCHET TOOTH WHEN FEED PAWL IS IN REARMOST POSITION. IF NECESSARY, REFINE DETENT ROLLER BRACKET AND FEED PAWL POSITION ADJUSTMENTS.

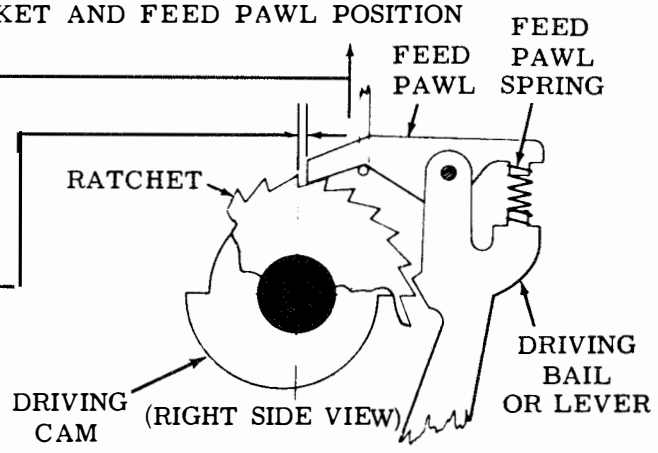
FEED PAWL SPRING TENSION

To Check

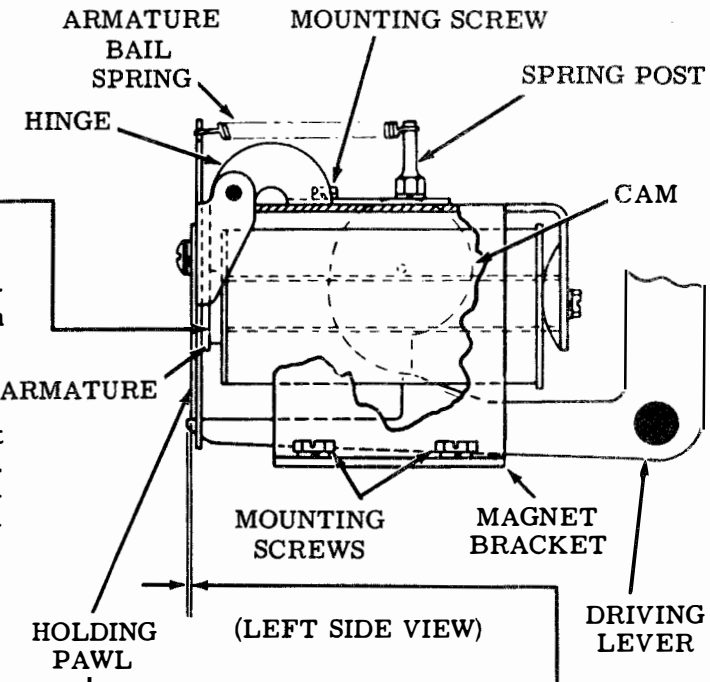
Rotate cam associated with pawl to step pawl back from tooth to 0.025 to 0.080 inch clearance (one or two steps).

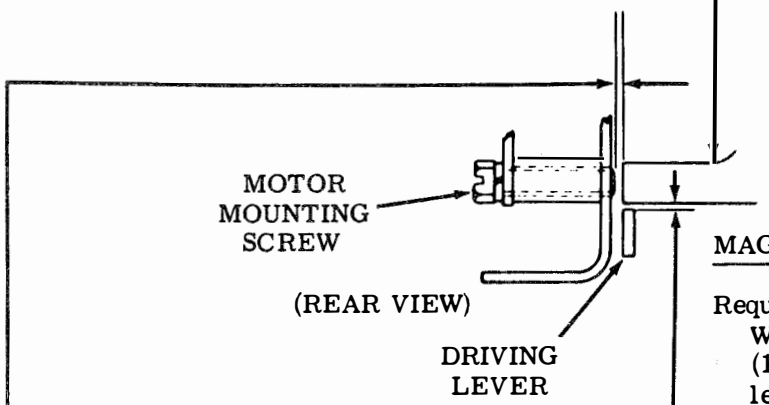
Requirement (3 Springs)

Min 3 ozs---Max 8 ozs
To start pawl moving.



2.09 Magnet Armature





MAGNET ARMATURE

Requirement

When not engaged with driving lever, armature fully engages face of magnet core when manually held against core.

To Adjust

Armature bail spring removed. Spring post and hinge mounting screw friction tight. Driving lever clear of holding pawl. Position hinge with armature manually depressed.

HOLDING PAWL

Requirement

Driving lever at high point on cam, and armature manually engaged with core.

(1) Pawl clears driving lever by:
Min 0.003 inch---Max 0.007 inch

(2) Clearance between end of pawl and motor mounting screw:
Min 0.015 inch

To Adjust

Position holding pawl with mounting screws friction tight.

MAGNET MOUNTING BRACKET

Requirement

With armature fully engaged to core face.

(1) Holding pawl must fully engage driving lever.

(2) Driving lever extension over pawl:
Min some---Max 0.015 inch

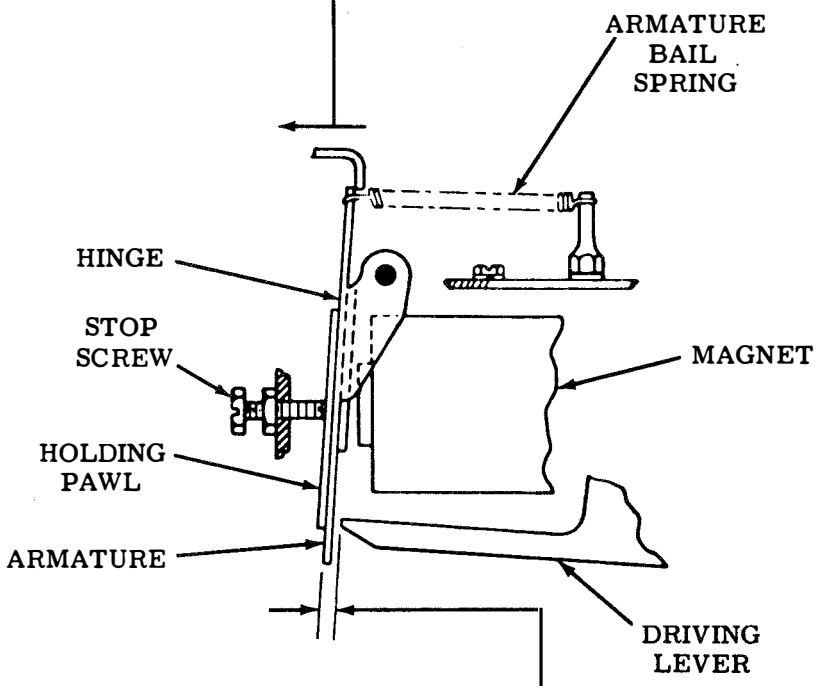
To Adjust

With magnet bracket mounting screws and holding pawl mounting screws friction tight, driving lever on high point of cam and hooked under pawl, manually hold armature fully engaged. Position bracket and tighten bracket mounting screws.

2.10 Magnet Armature - Continued

MAGNET BAIL SPRING TENSION

Requirement
To start holding pawl moving from stop screw:
Min 22 ozs---Max 26 ozs



(LEFT SIDE VIEW)

ARMATURE STOP

Requirement
Magnet unoperated. Clearance between holding pawl and rear end of driving lever:
Min 0.008 inch---Max 0.015 inch

To Adjust
Position driving lever so that it blocks pawl. With lock nut loosened, position stop screw to meet clearance requirement. Tighten lock nut against mounting bracket.