

## LINE-MESSAGE REGISTERS

### 15 TYPE REQUIREMENTS

#### 1. GENERAL

1.01 This section covers 15-type message registers.

1.02 Reference shall be made to Section 020-010-711 covering general requirements and definitions for additional information necessary for the proper application of the requirements listed herein.

1.03 **Asterisk(\*)**: Requirements are marked with an asterisk when to check for them would necessitate dismantling or dismounting of apparatus or would affect the adjustment involved or other adjustments. No check need be made for these requirements unless the apparatus or part is made accessible for other reasons or its performance indicates that such a check is advisable.

1.04 The units wheel of 15-type registers advances one-half digit when the register operates and one-half digit when the register releases.

1.05 **Operate**: A register is said to operate if, when current is connected to its winding, the armature moves toward the core until stopped by the operating pawl, the normally open contacts close, and the units wheel advances one-half step.

1.06 **Nonoperate**: A register is said to nonoperate if, when a current is connected to its winding, the armature does not move from its unoperated position.

1.07 **Release**: A register is said to release if, when the current is reduced abruptly from the operate or hold value to the release value, the armature returns to the unoperated position, normally open contacts open, and the units wheel advances one-half step.

1.08 **Hold**: A register is said to hold if, after it has operated and the current through its winding is reduced abruptly from the operate to the hold value, the armature does not move from its operated position.

1.09 To check the requirements of registers equipped with a cover, the cover must be removed. Remove the pin holding the pull-out knob on the lever by gently tapping the pin with a 1/16-inch drive pin punch and a 4-ounce riveting hammer. Exercise care not to bend the reset lever when removing or replacing the pin. Pull the pull-out knob off the reset lever and remove the cover. When checking requirements, it may also be necessary to move the register mounting plate forward or to remove the register from the mounting.

1.10 This section contains no adjusting procedures for these registers. Requirements 2.01 through 2.17 specified herein apply only up to and including installation by the telephone company.

**Caution: Do not adjust line-message registers. If a line-message register does not meet the requirements, with the exception of register mounting and alignment, replace the register. Only the message register mounting and alignment may be adjusted.**

#### 2. REQUIREMENTS

2.01 **Alignment of Number Wheels** (registers equipped with cover only): Fig. 1 (A) — With the register in the unoperated position, after having been electrically operated and released, the following requirements shall be met.

(a) The top of any figure on a number wheel shall not lie above the top edge of the window.

(b) The bottom of any figure on a number wheel shall not lie below the bottom edge of the window.

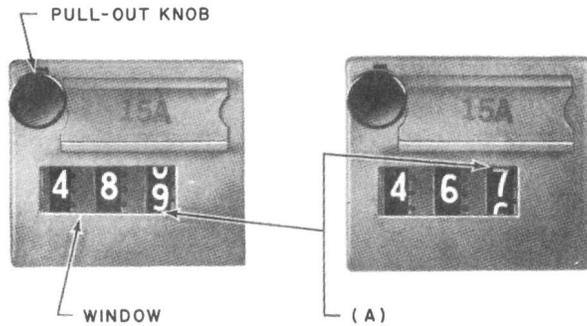


Fig. 1 - Alignment of Number Wheels

These requirements are considered met if a satisfactory check is obtained after each of ten consecutive operations of the register.

Gauge by eye through the window.

### 2.02 Armature Operation

(a) The operating pawl shall advance the star wheel and the units wheel by one-half digit when the register is operated.

Gauge by eye.

(b) The operating pawl shall advance the star wheel and the units wheel by one-half digit when the armature is released.

Gauge by eye.

### 2.03 Reset Operation

(a) With the reset lever fully operated and released, the register shall reset to 000 from all readings. This requirement shall be met a minimum of ten times.

Gauge by eye.

To check this requirement, the register may be set to a reading of 154 at the time of each reset by operating the register mechanically. Operate the register by pushing the armature toward the core with the KS-6320 orange stick and then releasing the armature.

(b) **Fig. 2 (A)** — With the number wheels held in the reset position by the reset bracket fingers, the top of any zero shall not be out of alignment with the top of any other zero by more than one-half the thickness of the line forming the zero.

Gauge by eye.

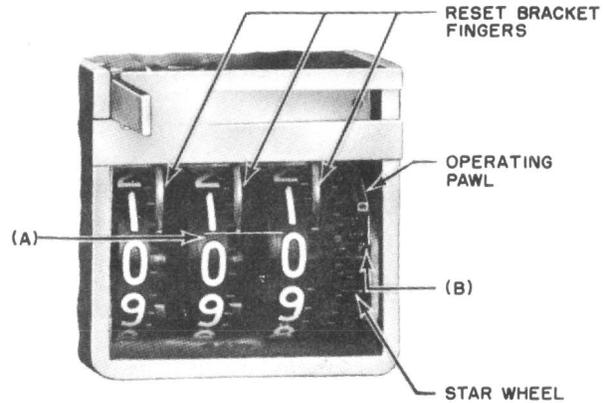


Fig. 2 - Zero Alignment With Number Wheels Held in Reset Position

### 2.04 Reset Bracket Position

(a) With the reset bracket in the unoperated position, at least one of the reset bracket legs shall rest against the edge of the notch in the bottom of the frame. The clearance between the other leg and its associated notch shall be

Max 0.005 inch

Use the 92U gauge.

(b) **Fig. 3 (A)** — With the reset lever fully operated, the clearance between the adjusting tab on the lever and the front brace shall be

Min 0.008 inch

Use the 92W gauge.

### 2.05 Operating Pawl Position

(a) **Fig. 2 (B)** — With the endplay in the number wheels taken up to the left and the endplay in the armature taken up to the right, the projection, if any, of the operating pawl over the side of the star wheel shall be

Max 0.015 inch

Gauge by eye.

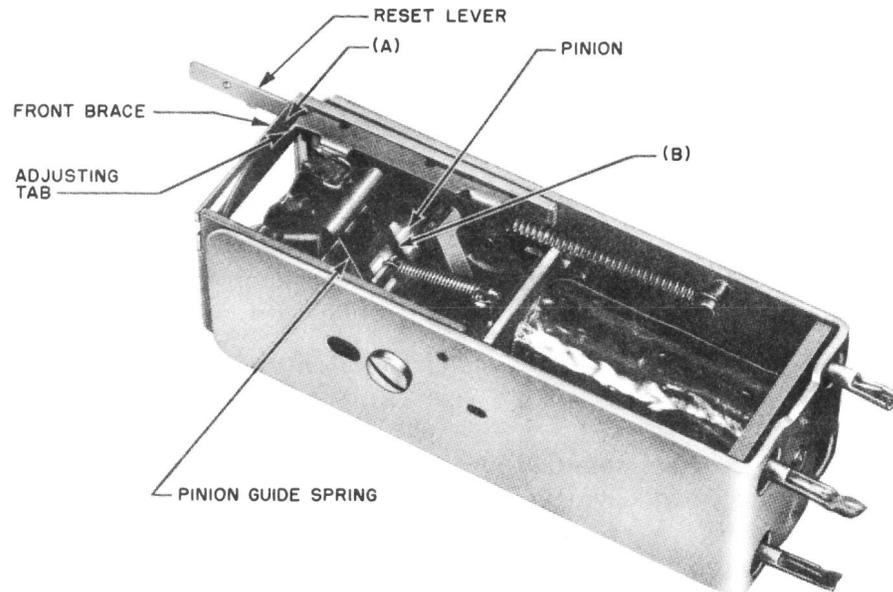
The operating pawl is 0.044 inch wide.

(b) **Fig. 4 (A)** — With the endplay in the armature taken up to the right, the clearance between the operating pawl and the adjacent side of the frame shall be

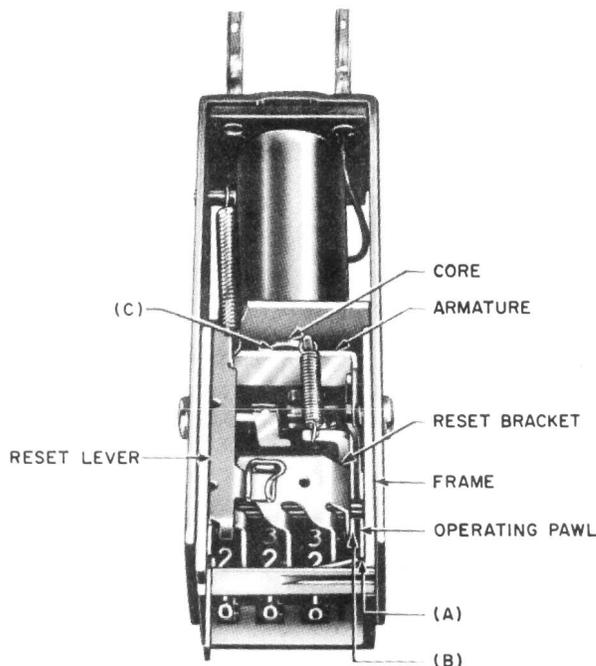
Min 0.015 inch

Gauge by eye.

The operating pawl is 0.044 inch wide.



**Fig. 3 - 15-Type Message Register With Reset Lever Operated**



**Fig. 4 - Operating Pawl Position**

(c) **Fig. 4 (B)** — With the endplay in the armature taken up to the left, the operating pawl shall not touch the reset bracket. Gauge by eye.

### 2.06 Pinion Guide Spring Position

(a) With the reset lever in the unoperated position, the clearance between the pinion guide spring and the ends of all pinion teeth shall be

Min 0.010 inch

Gauge by eye.

To check this requirement, operate the register mechanically by pushing the armature toward the core using the KS-6320 orange stick. If the pinion teeth do not touch the pinion guide spring as the register is operated, the requirement is considered met.

(b) **Fig. 3 (B)** — With the reset lever operated, the pinion guide spring shall rest against the long teeth of the tens and hundreds pinions and any two alternate teeth of the units pinion.

Gauge by eye.

### 2.07 Freedom of Operation

(a) The reset lever shall slide freely.

Gauge by feel.

(b) The number wheels shall not bind on their associated shaft.

Gauge by feel.

SECTION 030-333-701

(c) The pinions shall rotate freely on their associated shaft.

Gauge by feel.

**2.08 Endplay**

(a) There shall be perceptible endplay between the armature and the frame.

Gauge by eye.

(b) There shall be perceptible endplay between the reset bracket and the end pinion. This end play shall not exceed

Max 0.008 inch

Use the 92W gauge.

**Note:** The endplay may be maximum 0.016 inch, provided that requirement 2.03(a) is met a minimum of 20 times.

(c) There shall be perceptible endplay between the reset bracket and the frame. This endplay shall not exceed

Max 0.008 inch

Use the 92W gauge.

**2.09 Register Mounting and Alignment:** Registers shall be mounted approximately level and shall be fastened securely to the mounting plate.

Gauge by eye and feel.

**Note:** Registers may be mounted in any position for special applications.

To check this requirement, apply light pressure to the register in the horizontal and vertical directions. Do not attempt to turn the register.

**2.10 Contact Separation:** Fig. 5 (A) — With the armature in the unoperated position, the contact separation of the normally open contacts shall be

Min 0.020 inch

Use the 92G gauge.

**2.11 Contact Make:** When the register is operated, normally open contacts shall make and have an observable contact follow.

Gauge by eye.

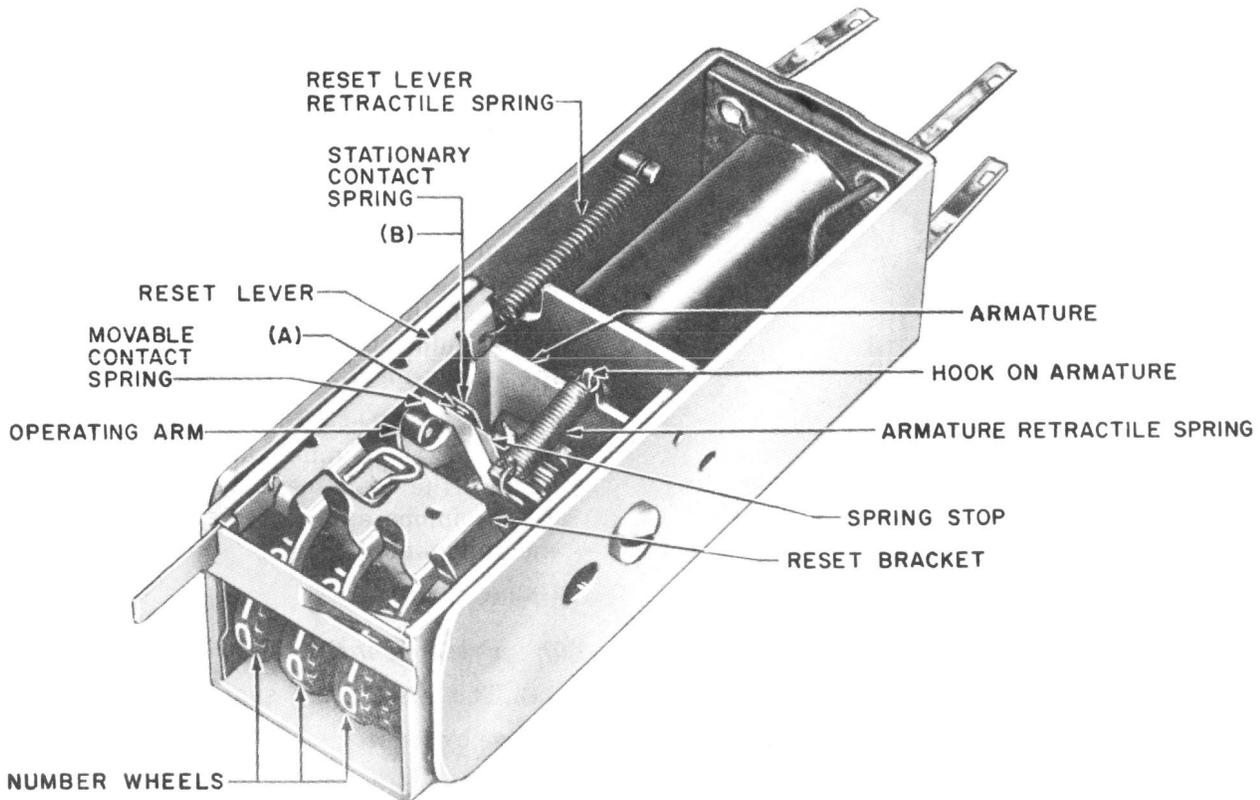


Fig. 5 - 15-Type Message Register Having Normally Open Contacts

To check this requirement, operate the register mechanically by slowly pushing the armature toward the core. Observe the contact follow after the contacts make.

**\*2.12 Contact Spring Tension:** Fig. 5 (B) —

With the armature in the unoperated position, the tension of the stationary spring against the spring stop shall be

Min 8 grams

Max 20 grams

Use the 70H gauge.

To check this requirement, apply the 70H gauge to the tip of the stationary spring and measure the tension as the spring leaves the spring stop.

**\*2.13 Armature Retractable Spring Tension:**

With the armature in the operated position, the tension of the armature retractile spring shall be

Min 42 grams

Use the 70G gauge.

To check this requirement, apply the gauge to the hook on the armature to which the retractile spring is attached. Move the armature to its operated position with the gauge. Remove the contact spring tension from the armature by lifting the contact spring from the operating arm using the KS-6320 orange stick. Then slowly release the tension and measure the retractile spring tension as the armature leaves its operated position.

**\*2.14 Reset Lever Spring Tension**

(a) **Reset Bracket Equipped With Coil Spring:** With the reset lever in the unoperated position, the tension of the reset lever spring shall be

Min 340 grams

Max 420 grams

Use the 62B gauge.

To check this requirement hold the reset bracket to prevent it from moving and apply the 62B gauge to the rear of the reset lever. Slowly move the reset lever forward with the gauge. Measure the tension as the reset lever starts to move forward.

(b) **Reset Bracket Not Equipped With Coil Spring:** With the reset lever in the unoperated position, the tension required to move the lever forward shall be

Min 150 grams

Use the 62B gauge.

To check this requirement, apply the 62B gauge to the rear of the reset lever. Slowly move the lever forward. Measure the tension as the reset lever starts to move forward.

**2.15 Contact Alignment:** Fig. 6 (A) — The contact alignment shall be within the limits indicated in Fig. 6.

Gauge by eye.

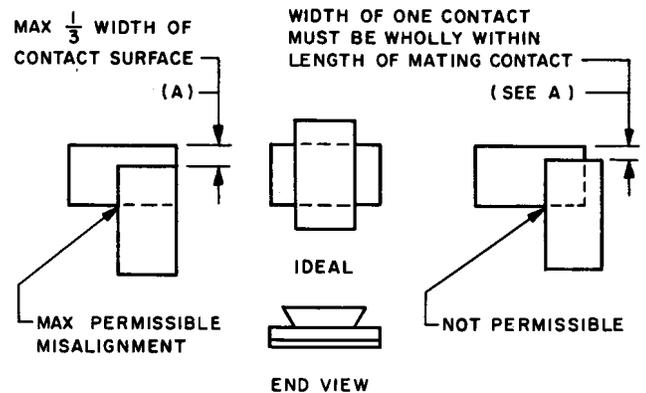


Fig. 6 — Alignment of Contacts

**\*2.16 Operated Armature Gap:** Fig. 4 (C) —

With the armature electrically operated, the gap between the armature and the core at the closest point shall be

Min 0.005 inch

Use the 92T gauge.

**2.17 Electrical Requirements:** The register shall meet the electrical requirements specified on the circuit requirements table. The requirements shall be applied in the following order: Operate, Hold, Release, and Nonoperate.