

BELL SYSTEM PRACTICES  
Private Branch Exchange  
Inst. and Mtce.

SECTION B490.644  
Issue 2, 3-30-49  
AT&TCo Standard

## RELAYS

E, EA, F, H, R AND T TYPES

(Reference Section for B461.004)

### 1. REQUIREMENTS

1.01 Armature and Spring Stud Clearance -  
Fig. 101 (A): Studs shall clear  
springs through which they pass.

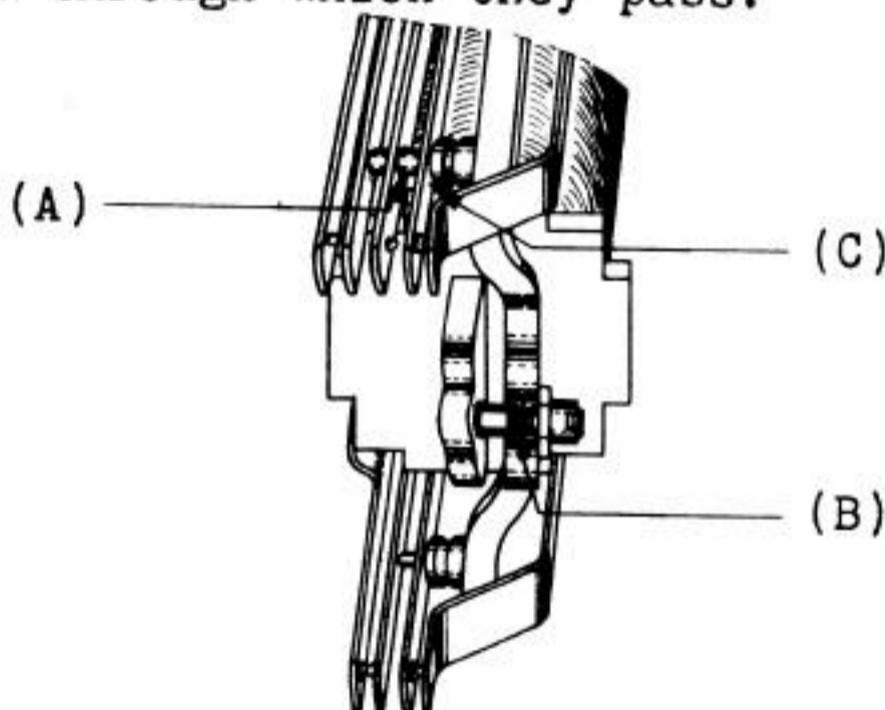


Fig. 101 - E Type Relay

1.02 Spring Tang Position: - Overlap spool-  
head  $1/32''$  but do not rub on spoolhead  
when spring is moved.

1.03 Adjusting Stud Clearance - Fig. 101(B):  
Armature shall clear stud.

1.04 Armature Travel:- Meet requirements on circuit requirement table. Tolerance - Test + .005" - .0025", Readj. + .0025" - .0025". 67 type gauges.

1.05 Contact Pressure

(a) As indicated in "Cont. Press." and "Fig. No." columns of circuit requirement table. For figures covered by "Fig. No." → see pages 3 to 8. Nos. 70D and 70J gauges.

(b) "A" in figures, pages 3 to 8 means no definite tension but armature must rest on adjusting nut.

↖ (c) If circuit requirement table or figures on pages 3 to 8 specify a definite tension for a spring resting against an armature stud, check as spring leaves stud with armature held manually against adjusting nut.

L 1.06 Stud Gap - Fig. 101 (C): Clearance at points designated S in figures on pages 3 to 8.

Exception: Requirement is met for springs with 25 grams pressure or more (to meet non-operate requirement) regardless of minimum tension specified if contacts do not break with test .003", readjust .005" gauge between adjusting nut and armature. 67 type gauges.

1.07 Contact Separation:- .005". No. 74D gauge.

→ 1.08 Contact Follow:- .004" for normally open contacts. Check with relay operated on test or readjust current with following gauges between armature and core. 67 type gauges.

	<u>E,EA,F,H and R Types</u>	<u>T Type</u>
<u>Test</u>	.003"	.004"
<u>Readjust</u>	.004"	.005"

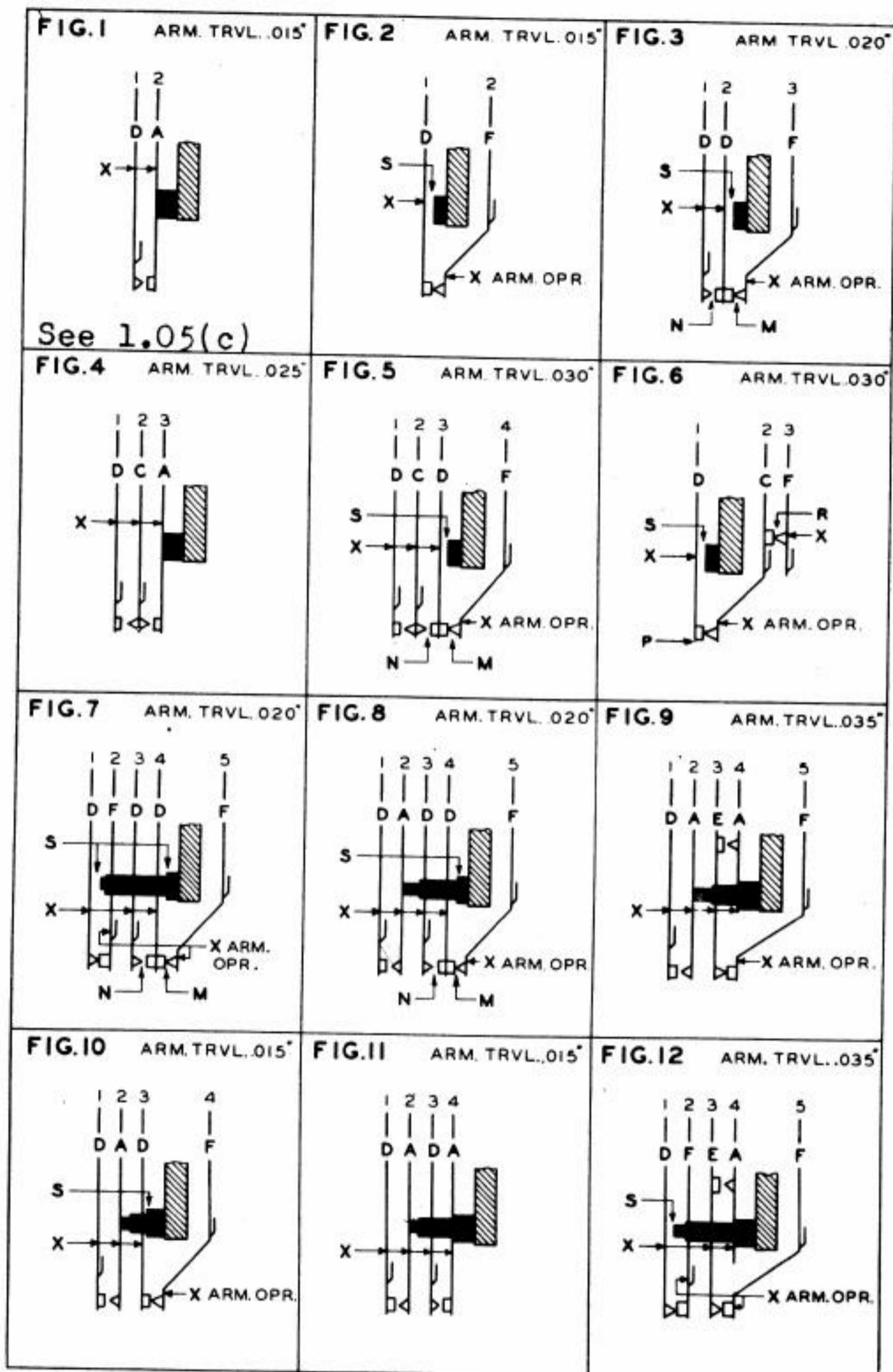
(a) If circuit requirement table specifies armature need not touch core on operate current, follow is satisfactory if following tests are met with relay energized on test or readjust current.

(1) Relays with Combination 31, 32, 33, 38, 39:- Make contacts make with .004" gauge between stop pins and core. Make contacts not make with .006" gauge between stop pins and core for combination 31, 32, 33, 39 and contacts 1 and 2 of 38. 67 type gauges.

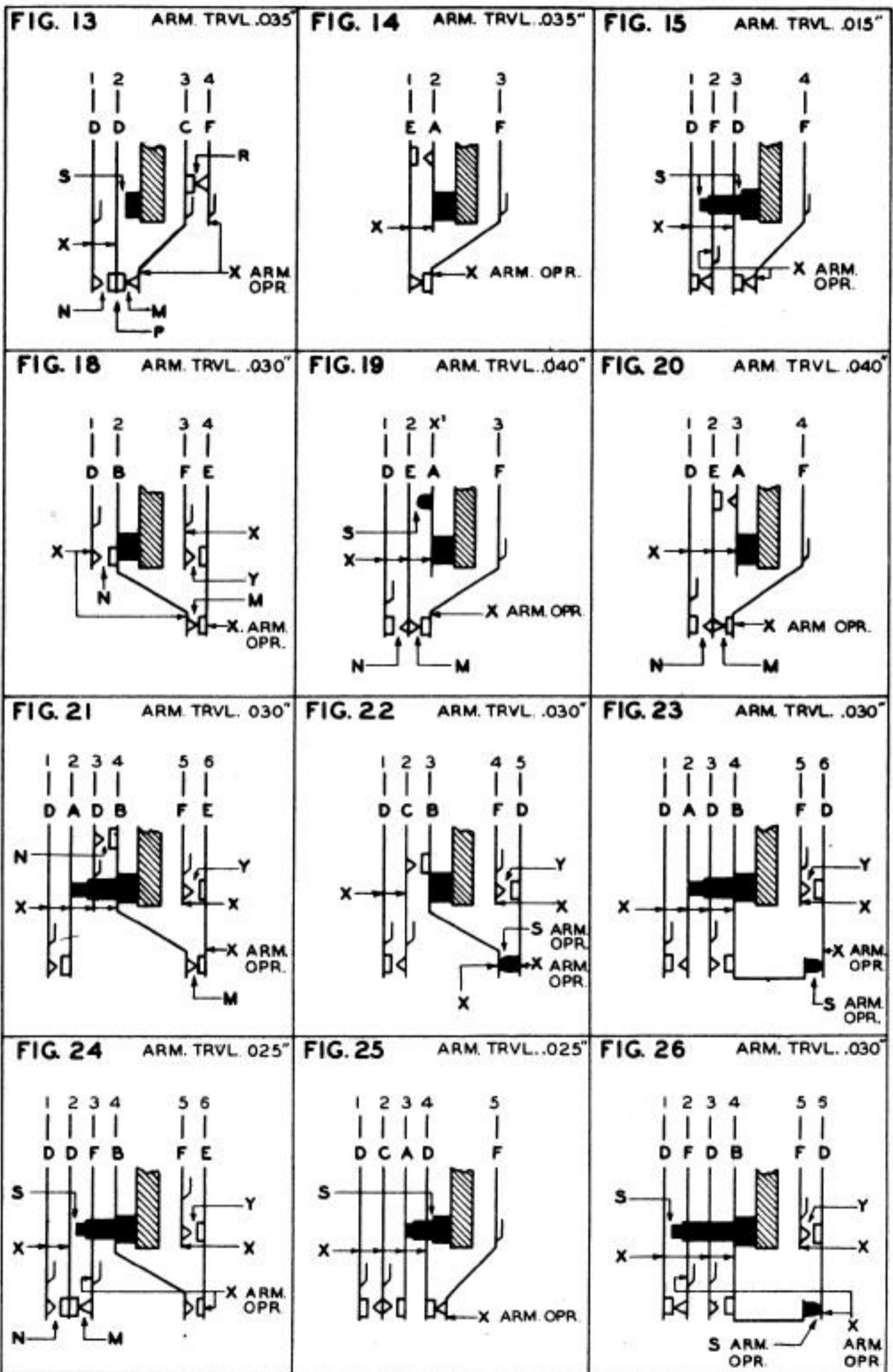
(2) Relays other than in (1): Observable follow of spring as opposing spring is moved away.

(b) When circuit requirement table specifies .008" or .010" follow, follow will be satisfactory if contacts make with relay energized on test or readjust current with .006" gauge for .008" follow, .007" gauge for .010" follow between stop pins and core. 67 type gauges.

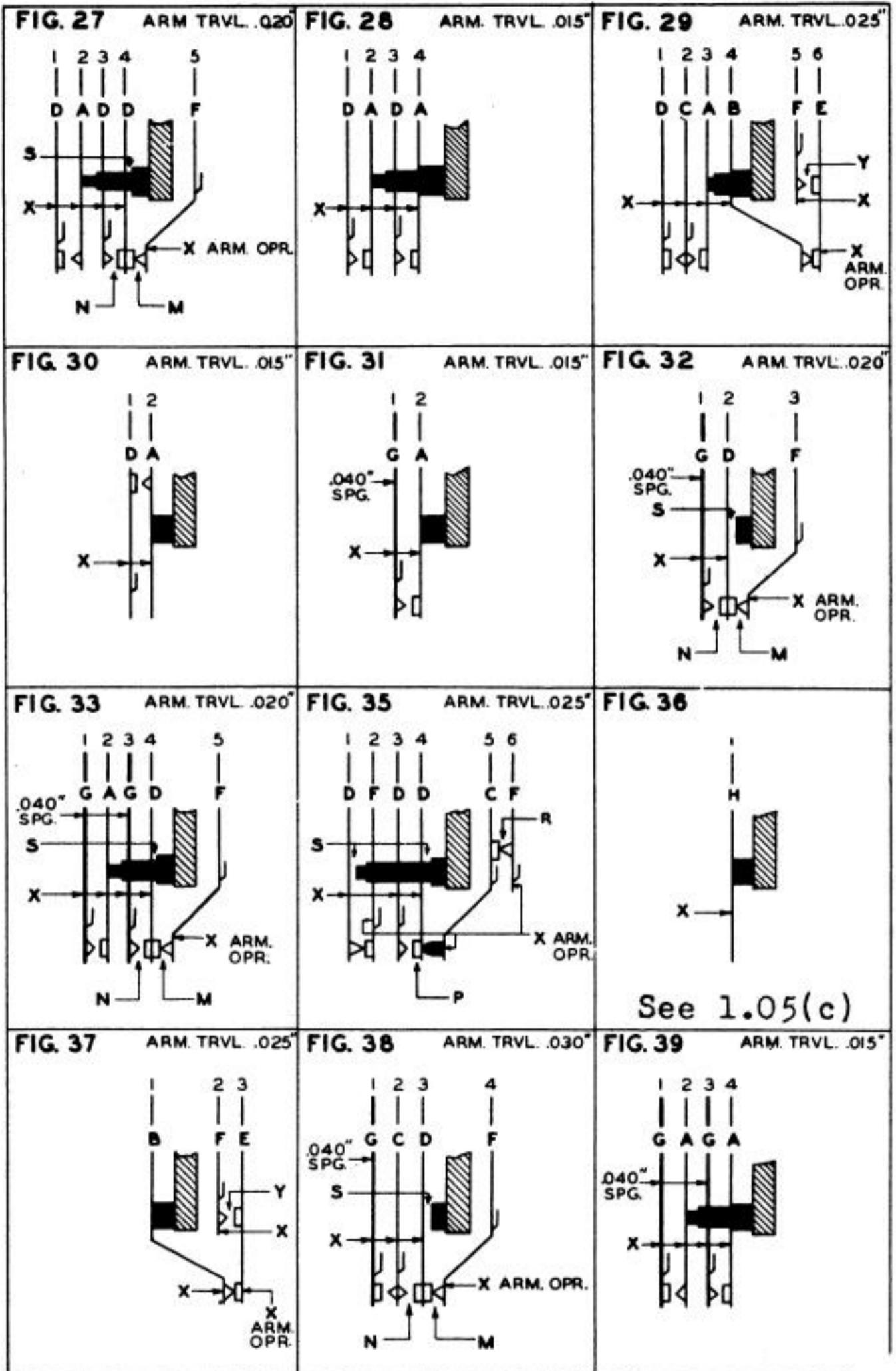
1.09 Spring Sequence:- Meet sequence requirements on figures pages 3 to 8 or on circuit requirement table.



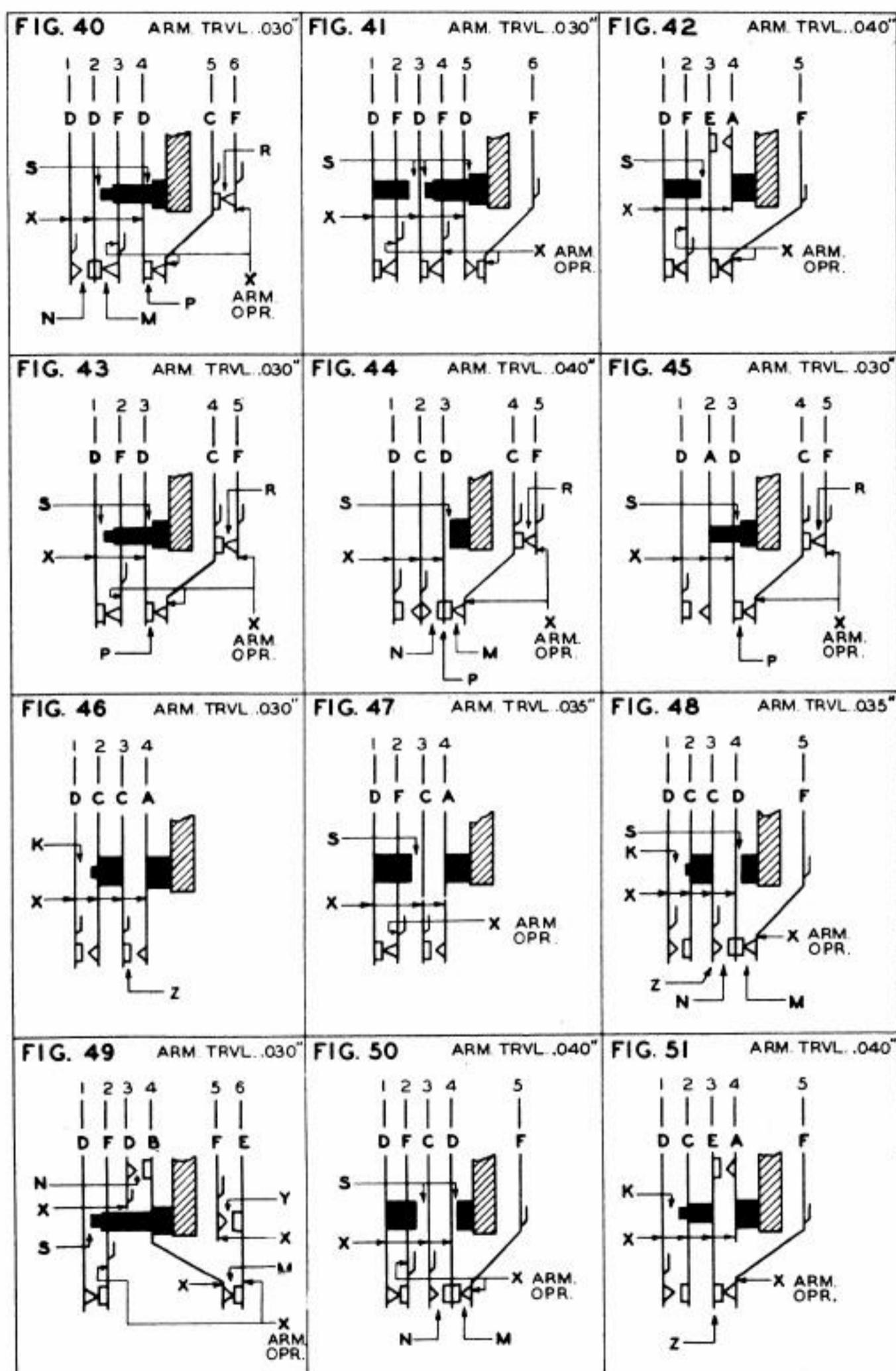
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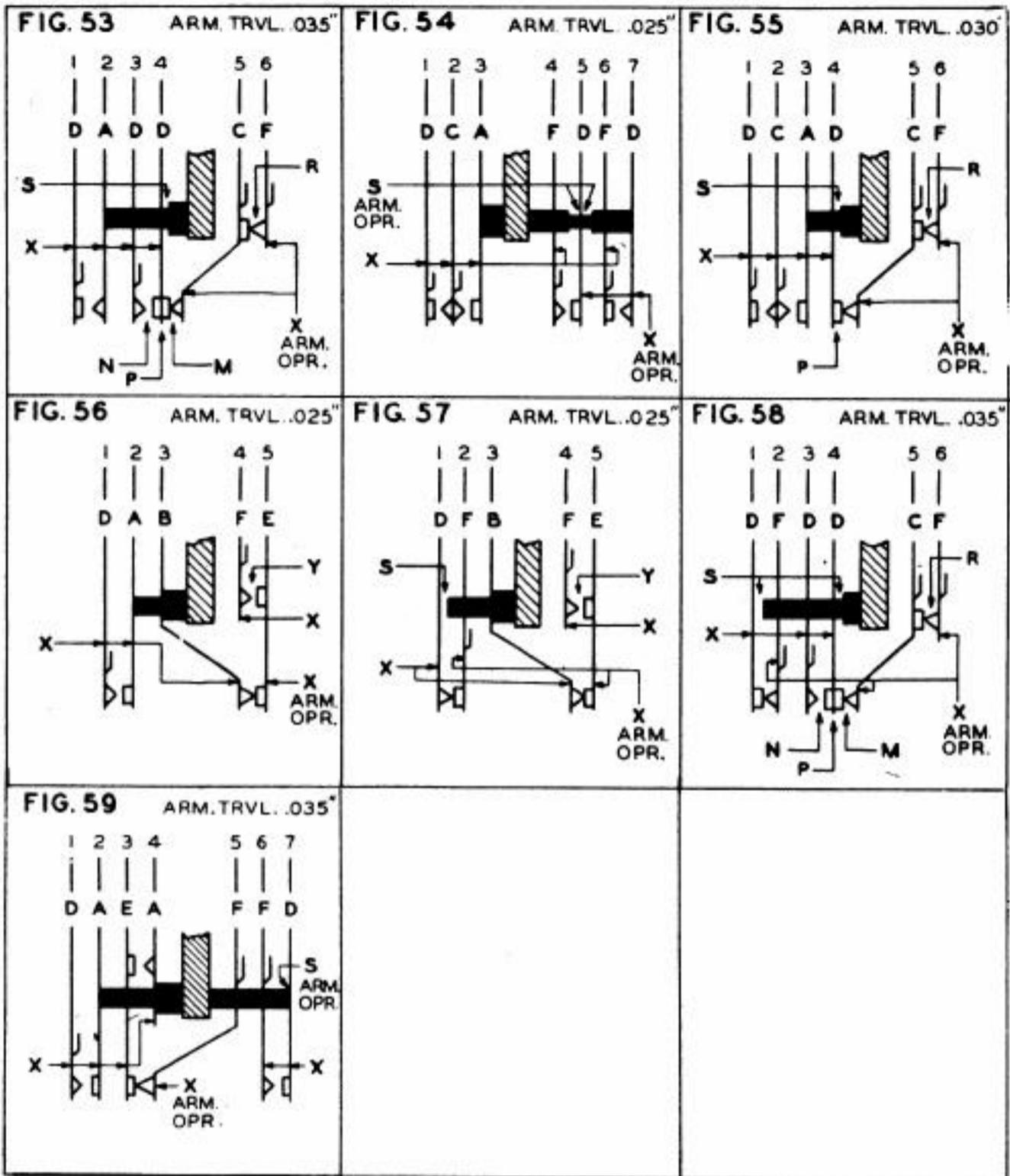
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Explanation of Designations Used in Figures Pages 3 to 8.

A = Hold armature against adj. nut. (1.05 b).

→ B and Y = Tension of B shall insure .005" separation at Y contacts.

Cont.Press.		Spring Designations					
		C	D	E	F	G	H
L or 10	T	5	8	20	25	95	15
	R	6	9	22	27	100	17
H or 20	T	5	15	20	25	95	15
	R	6	17	22	27	100	17

K = Clearance between stem of stud and spring 1 (Arm. Opr.) .010"

M and N = M shall break before N makes

→ P and R = Gauge tension of P as R breaks

→ S = Clearance (1.06)

X = Arrows indicate direction of tension

↖ X' = Balancing Spring

Z = Gauge tension of spring with stud of spring 2 resting on it

∪ = Spoolhead spring

Bell Telephone Laboratories, Inc.