

RELAYS  
AF, AG, AND AJ TYPES  
(WIRE-SPRING TYPES)  
REQUIREMENTS  
(CONDENSED SECTION FOR 040-502-701)

1. REQUIREMENTS (also see Section 020-012-711)

- 1.01 *Contact Cover Clearance:* Contact cover clears card with cover pushed against stops.
- 1.02 *Armature Position:* Fig. 1 (A)—Armature hinge spring legs, where secured to armature, bear against outer core legs; relay operated and unoperated.

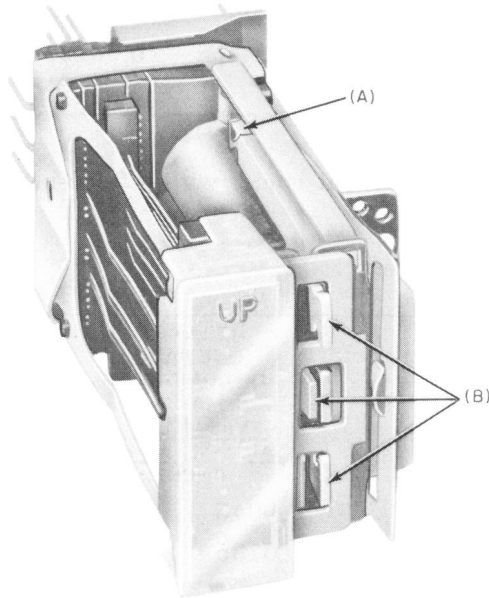


Fig. 1 — AJ-Type Relay

- 1.03 *Balancing Spring Tension:* Fig. 1(B)—Card bears against associated surfaces on armature and armature bears against backstop; relay unoperated.
- 1.04 *Armature Back Tension:* Armature bears against backstop.
- (a) *AF-Type and 12-Position AJ-Type:* Min 25 grams (readjust 30 grams; max 60 grams not applicable if nonoperate or release electrical requirements are specified). 70D or 70J gauge.
- (b) *24-Position AJ-Type:* Min 40 grams (readjust 45 grams; max 80 grams not applicable if nonoperate or release electrical requirements are specified). 70D or 70J gauge.
- (c) *AG-Type:* Min 15 grams (readjust 20 grams). 70D gauge.
- 1.05 *Contact Make and Break*
- (a) Both contacts of movable twin springs make in operated position for make contacts and in unoperated position for break contacts.
- (b) With relay energized against 171A gauge, except where noted, make and break contacts meet following requirements.

SECTION 040-930-701

TEST

- (1) *Before Turnover:* (Refer to Section 040-502-701 for requirements.)
- (2) *After Turnover:*

MAKE CONTACTS	NEITHER PAIR OF CONTACTS MAKE <u>ALL RELAYS</u> (INCH)	AT LEAST ONE PAIR OF CONTACTS MAKE <u>ALL RELAYS</u> (INCH)
	Spring combination No. 1 to 199, 500 and up	†#0.007
Spring combination No. 200 to 399	#0.007	0.0015
Spring combination No. 400 to 499	#0.010	0.0015

BREAK CONTACTS	AT LEAST ONE PAIR OF CONTACTS DO NOT BREAK <u>ALL RELAYS</u> (INCH)	BOTH PAIRS OF CONTACTS BREAK <u>ALL RELAYS</u> (INCH)
	Spring combination No. 1 to 199, 500 and up	†#0.007
Spring combination No. 200 to 399	#0.007	0.0015
Spring combination No. 400 to 499	#0.010	0.0015

# Gauge inserted between armature and backstop.

† For relays having six or less pairs of movable twin springs, requirement is met with 0.0045-inch gauge inserted between armature and backstop.

READJUST

MAKE CONTACTS	NEITHER PAIR OF CONTACTS MAKE TYPE RELAY		AT LEAST ONE PAIR OF CONTACTS MAKE TYPE RELAY	
	<u>AF</u>	<u>AG &amp; AJ</u>	<u>AF</u>	<u>AG &amp; AJ</u>
	(INCH)		(INCH)	
M (Make)	0.012	0.0145	0.0045	0.005
EM (Early Make)	0.0215	0.0255	0.0135	0.016
PM (Preliminary Make)	0.031	0.0365	0.023	0.027

BREAK CONTACTS	AT LEAST ONE PAIR OF CONTACTS DO NOT BREAK TYPE RELAY		BOTH PAIRS OF CONTACTS BREAK TYPE RELAY	
	<u>AF</u>	<u>AG &amp; AJ</u>	<u>AF</u>	<u>AG &amp; AJ</u>
	(INCH)		(INCH)	
B (Break)	±0.012	±0.0145	0.0045	0.005
EB (Early Break)	0.0215	0.0255	0.0135	0.016
PB (Preliminary Break)	0.031	0.0365	0.023	0.027

± Relays having spring combination No. 1 to 199 and 500 and up with 7 or more pairs of movable twin springs also meet specified condition with 0.007-inch gauge inserted between armature and backstop.

**1.06 Contact Sequence**

**TEST**

- (a) **EMB Position:** EM contacts make before B contacts break.
- (b) **EBM Position:** EB contacts break before M contacts make.
- (c) **PMEB Position:** PM contacts make before EB contacts break.
- (d) **PBEM Position:** PB contacts break before EM contacts make.
- (e) **EM, EB, PM, and PB Position:** Check sequence if note on circuit requirement table so specifies.

**Readjust:** Covered by readjust requirement 1.05.

**1.07 Buffer Spring Position**

- (a) With relay energized against 171A gauge, buffer spring meets conditions covered below.

	<u>TYPE RELAY</u>	<u>NO MOVEMENT (INCH)</u>	<u>PERCEPTIBLE MOVEMENT (INCH)</u>
*Test (After Turnover)	All Relays	—	0.0015
Readjust	AF	0.007	0.003
	AG & AJ	0.0085	0.0035

\*For before turnover requirement, refer to Section 040-502-701.

- (b) **Buffer Spring Positioned by Core Plate:** Portion of spring between positioning lugs rests against core plate; relay operated and unoperated.
- (c) Buffer spring not used; card should not touch spring operating lug; relay operated.

**1.08 Buffer Spring Tension:** Min 20 grams (readjust 25 grams). 70D gauge.

TABLE A – SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS

CONTACT POSITIONS	SPRING COMBINATION FIGURE NUMBERS									
	1	2	3	4	5	6	7	8	9	10
12	—	—	—	—	M	M	M	M	—	—
11	—	—	—	—	—	M	M	M	—	—
10	—	—	M	M	M	M	M	M	—	—
9	—	—	—	—	—	M	M	M	—	—
8	—	M	M	M	M	M	M	M	—	—
7	—	—	—	—	—	—	—	M	B	B
6	M	M	M	M	M	M	M	M	M	M
5	—	—	—	—	—	—	M	M	—	B
4	—	—	M	M	M	M	M	M	—	—
3	—	—	—	—	—	M	M	M	—	—
2	—	—	—	M	M	M	M	M	—	—
1	—	—	—	—	—	M	M	M	—	—
	11	12	13	14	15	16	17	18	19	20
12	—	M	M	M	M	M	—	—	M	M
11	—	—	—	M	M	M	—	—	—	M
10	M	M	M	M	M	M	—	M	BM	M
9	—	—	—	—	M	M	—	—	—	—
8	M	M	M	M	M	M	M	BM	BM	BM
7	B	B	B	B	B	B	—	—	—	—
6	M	M	M	M	M	M	BM	BM	BM	BM
5	—	—	B	—	—	B	—	—	—	—
4	M	M	M	M	M	M	—	M	BM	M
3	—	—	—	M	M	M	—	—	—	M
2	M	M	M	M	M	M	—	—	M	M
1	—	—	—	M	M	M	—	—	M	M
	21	22	23	24	25	26	27	28	29	30
12	M	—	—	—	M	M	M	M	M	M
11	M	—	B	—	—	M	—	B	M	—
10	M	—	—	BM	BM	BM	M	BM	M	M
9	M	—	B	B	—	M	—	B	—	—
8	BM	BM	—	BM	BM	BM	BM	BM	M	M
7	M	—	B	B	B	B	B	B	B	B
6	BM	BM	—	BM	BM	BM	BM	BM	BM	BM
5	M	—	B	B	B	M	—	B	B	B
4	BM	—	—	BM	BM	BM	M	BM	M	M
3	M	—	B	B	—	M	—	B	—	—
2	M	—	—	M	M	M	M	M	M	M
1	M	—	—	—	—	M	—	B	M	—

M — Make  
B — Break

See Reqt 2.11

BM — Break Make — See Reqt 2.11 and 2.12

TABLE A – SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT POSITIONS	SPRING COMBINATION FIGURE NUMBERS										
	31	32	33	34	35	36	37	38	39	40	
12	BM	—	—	BM	M	—	—	—	—	B	
11	M	—	—	M	M	—	—	—	—	B	
10	BM	M	M	BM	M	M	—	—	—	M	
9	—	—	B	M	B	B	—	—	—	B	
8	BM	BM	M	BM	M	M	M	M	M	M	
7	B	B	B	M	B	B	B	B	B	B	
6	BM	BM	M	BM	M	M	M	M	M	M	
5	—	—	B	M	B	B	—	—	B	B	
4	BM	M	M	BM	M	M	—	M	M	M	
3	M	—	B	M	B	—	—	—	—	B	
2	BM	—	—	BM	M	M	—	—	—	M	
1	M	—	—	M	M	—	—	—	—	B	
	41	42	43	44	45	46	47	48	49	50	
12	—	M	—	—	—	—	—	M	M	—	
11	—	B	—	—	—	—	—	M	M	—	
10	—	M	—	—	—	—	—	M	BM	—	
9	—	B	B	—	B	—	—	—	—	—	
8	M	BM	M	M	M	M	—	M	BM	BM	
7	B	B	B	B	B	—	B	B	—	—	
6	M	BM	M	BM	M	M	—	M	BM	BM	
5	B	B	B	—	B	—	—	—	—	—	
4	—	M	—	M	M	M	—	M	BM	BM	
3	—	B	B	—	—	—	—	—	—	—	
2	—	M	—	—	—	—	—	M	M	—	
1	—	B	—	—	—	—	—	M	M	—	
	51	52	53	54	55	56	57	58	59	60	
12	M	—	—	—	—	B	—	B	BM	—	
11	M	—	—	—	—	—	BM	—	B	BM	
10	M	B	—	M	B	B	M	M	BM	—	
9	B	—	—	—	—	—	BM	—	B	BM	
8	M	—	—	BM	M	M	—	B	BM	—	
7	B	—	—	—	—	—	BM	—	B	BM	
6	BM	M	B	BM	BM	BM	B	—	BM	BM	
5	B	—	—	—	—	—	BM	—	B	BM	
4	M	—	—	M	M	M	M	—	BM	—	
3	—	—	—	—	—	—	BM	—	B	BM	
2	M	—	—	B	—	B	M	BM	BM	—	
1	M	—	—	—	—	—	BM	—	B	BM	

M — Make  
B — Break

See Reqt 2.11.

BM — Break Make — See Reqt 2.11 and 2.12.

TABLE A – SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT POSITIONS	SPRING COMBINATION FIGURE NUMBERS										
	61	62	63	64	65	66	67	68	69	70	
12	M	M	M	BM	M	M	M	M	—	BM	
11	M	M	M	BM	—	—	—	—	—	BM	
10	M	BM	BM	BM	M	M	M	M	B	BM	
9	M	—	M	BM	—	—	—	B	—	—	
8	BM	BM	BM	BM	M	M	B	M	BM	BM	
7	M	—	M	BM	—	B	—	B	—	—	
6	BM	BM	BM	BM	BM	M	B	M	BM	BM	
5	M	—	M	BM	—	—	—	B	—	—	
4	M	BM	BM	BM	M	M	M	M	BM	BM	
3	M	M	M	BM	—	—	—	—	—	—	
2	M	M	M	BM	M	M	M	M	—	BM	
1	M	M	M	BM	—	M	—	—	—	BM	
	71	72	73	74	75	76	77				
12	—	—	M	—	B	—	BM				
11	—	—	—	—	—	—	BM				
10	M	M	M	—	—	M	BM				
9	—	—	—	—	—	—	M				
8	M	M	M	BM	—	BM	BM				
7	—	B	B	—	—	B	M				
6	B	BM	BM	BM	—	BM	BM				
5	—	B	—	—	—	B	M				
4	M	M	M	M	—	M	BM				
3	—	—	—	—	—	—	M				
2	M	M	M	—	M	M	BM				
1	—	—	M	—	M	—	BM				
	200	201	202	203	204	205	206	207	208	209	
12	—	—	—	—	M	EMB	EM	—	EMB	—	
11	—	—	—	—	—	M	M	—	—	—	
10	M	—	—	EBM	M	EBM	M	—	EBM	—	
9	—	—	—	—	—	—	—	—	—	—	
8	EBM	EBM	EBM	EBM	EBM	EBM	EBM	EBM	EBM	—	
7	B	—	B	—	B	—	—	—	—	—	
6	EMB	EBM	EMB	EBM	EBM	EMB	EMB	EMB	EMB	EBM	
5	B	—	—	—	—	—	—	—	—	—	
4	EBM	—	M	EBM	EBM	EBM	EBM	EBM	EBM	—	
3	—	—	—	—	—	—	M	—	—	—	
2	M	—	—	—	M	EBM	M	—	EBM	—	
1	—	—	—	—	M	M	M	—	—	—	

M — Make  
B — Break

See Reqt 2.11.

BM — Break Make  
EBM — Early Break Make  
EMB — Early Make Break

See Reqt 2.11  
and 2.12.

TABLE A – SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT POSITIONS	SPRING COMBINATION FIGURE NUMBERS										
	210	211	212	213	214	215	216	217	218	219	
12	M	—	EM	EM	EM	EM	—	EBM	—	EMB	
11	—	—	M	—	—	—	—	—	—	M	
10	M	—	EBM	M	M	M	—	EBM	M	M	
9	—	—	—	B	—	—	—	—	—	BM	
8	EBM	EBM	EBM	EBM	EBM	EBM	M	EBM	EBM	M	
7	—	—	B	B	B	B	—	—	B	BM	
6	EBM	EMB	EMB	EMB	EMB	EMB	EMB	EBM	EBM	EMB	
5	—	—	—	B	—	B	—	—	—	BM	
4	M	—	EBM	EBM	M	M	M	EBM	M	M	
3	—	—	—	—	—	—	—	—	—	BM	
2	M	—	M	M	M	M	—	EBM	—	M	
1	—	—	M	—	—	M	—	—	—	M	
	220	221	222	223	224	225	226	227	228	229	
12	EBM	EM	EM	EM	EMB	—	EMB	EBM	—	—	
11	EBM	—	—	M	M	—	BM	M	—	—	
10	EBM	M	M	M	EBM	M	EBM	EBM	M	—	
9	EBM	—	—	—	—	—	M	M	B	B	
8	EBM	EBM	EBM	EBM	EBM	EBM	EBM	EBM	EBM	M	
7	EBM	—	B	B	B	—	—	B	B	B	
6	EBM	EMB	EMB	EMB	EMB	EMB	EMB	EBM	EMB	EMB	
5	EBM	—	—	—	—	—	M	M	B	B	
4	EBM	M	M	M	EBM	M	EBM	EBM	M	M	
3	EBM	—	—	M	M	—	BM	M	B	—	
2	EBM	M	M	M	EBM	—	EBM	EBM	M	—	
1	EBM	—	M	M	M	—	BM	M	—	—	
	230	231	232	233	234	235	236	237	238	239	
12	M	M	—	—	EBM	EM	EM	—	—	EMB	
11	M	M	—	—	EBM	M	—	—	EMB	—	
10	EBM	EBM	M	M	EBM	M	M	M	—	EBM	
9	B	M	—	—	EBM	M	B	—	EMB	—	
8	EBM	EBM	M	EBM	EMB	EBM	EBM	EBM	—	EBM	
7	B	B	—	B	—	M	B	—	BM	B	
6	EBM	EBM	EMB	EBM	EMB	EMB	B	EBM	EBM	EMB	
5	B	B	—	B	—	M	BM	—	BM	—	
4	EBM	EBM	M	M	EBM	EBM	M	M	—	EBM	
3	—	M	—	—	EBM	M	—	—	EMB	—	
2	M	M	M	—	EBM	M	M	—	—	EBM	
1	M	M	—	—	EBM	M	M	—	EMB	M	

M — Make  
B — Break

See Reqt 2.11.

BM — Break Make  
EM — Early Make  
EBM — Early Break Make  
EMB — Early Make Break

See Reqt 2.11  
and 2.12.

TABLE A – SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT POSITIONS	SPRING COMBINATION FIGURE NUMBERS										
	240	241	242	243	244	245	246	247	248	249	
12	—	M	—	EM	EM	—	—	M	EM	EBM	
11	—	M	—	M	M	—	—	M	—	EBM	
10	EBM	EBM	—	M	M	EBM	—	M	M	EBM	
9	—	M	—	—	M	B	—	—	—	EBM	
8	EMB	EBM	M	EBM	EBM	EBM	EBM	EBM	M	EMB	
7	—	—	B	B	B	B	B	B	B	EBM	
6	EMB	EBM	EBM	EMB	EMB	EBM	EBM	EBM	EMB	EMB	
5	EM	M	B	—	B	B	B	—	B	EMB	
4	EB	EBM	M	EBM	M	EBM	M	EBM	M	EBM	
3	—	M	—	—	M	B	—	M	—	EBM	
2	—	M	—	M	M	M	—	M	M	EBM	
1	—	M	—	M	M	—	—	M	—	EBM	
	250	251	252	253	254	255	256	257	258	259	
12	EM	—	EMB	—	EBM	EM	—	EM	—	EBM	
11	B	—	M	—	EBM	M	—	M	—	EBM	
10	EBM	—	EBM	M	EBM	M	M	EBM	—	EBM	
9	B	—	M	—	—	—	B	M	—	EBM	
8	EBM	EBM	EBM	EBM	EMB	M	EBM	EBM	EMB	EM	
7	B	B	—	—	—	B	B	—	—	—	
6	EMB	EMB	EMB	EMB	EMB	EM	EMB	EMB	EMB	EMB	
5	B	B	—	—	—	B	B	M	—	EM	
4	EBM	—	EBM	EBM	EBM	M	EBM	EBM	M	EBM	
3	B	—	M	—	—	M	B	M	—	EBM	
2	M	—	EBM	—	EBM	M	—	EBM	—	EBM	
1	M	—	M	—	EBM	M	—	M	—	EBM	
	260	261	262	263	264	265	266	267	268	269	
12	—	M	M	M	—	EM	EM	—	M	M	
11	—	M	M	M	—	B	M	—	M	—	
10	—	M	EBM	EBM	M	EBM	M	M	M	M	
9	EB	—	M	—	B	B	B	—	M	—	
8	EMB	EBM	EMB	EBM	EBM	EBM	M	EBM	EBM	EMB	
7	EB	B	—	B	B	B	B	—	—	—	
6	EMB	EBM	EMB	EBM	EBM	EMB	EM	EBM	EBM	EMB	
5	B	B	—	—	B	B	B	—	—	EM	
4	M	M	EBM	EBM	M	EBM	M	EBM	EBM	—	
3	—	M	M	—	—	B	—	—	M	—	
2	—	M	EBM	M	—	EBM	M	—	M	M	
1	—	M	M	M	—	—	M	—	M	—	
M — Make	See Reqt 2.11.					EB — Early Break					
B — Break						EM — Early Make					
						EBM — Early Break Make					
						EMB — Early Make Break	See Reqt 2.11 and 2.12.				



TABLE A – SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT POSITIONS	SPRING COMBINATION FIGURE NUMBERS										
	270	271	272	273	274	275	276	277	278	279	
12	EM	EMB	B	—	—	EBM	EMB	EM	EB	EMB	
11	M	M	—	—	—	EBM	—	B	EBM	—	
10	M	EBM	EBM	EBM	M	EBM	EBM	M	EBM	M	
9	M	—	—	B	—	EB	—	B	EBM	B	
8	EBM	EBM	EBM	EBM	EBM	—	EBM	EBM	B	M	
7	B	B	—	B	—	M	—	B	M	B	
6	EMB	EMB	EMB	EBM	B	EMB	EMB	EMB	B	EMB	
5	M	—	—	B	—	—	—	B	EMB	B	
4	EBM	EBM	EBM	EBM	M	EBM	M	M	M	M	
3	M	—	—	B	—	EB	B	B	EBM	—	
2	M	EBM	—	—	EBM	EBM	EBM	M	EBM	—	
1	M	M	—	—	—	EBM	B	BM	EBM	—	
	280	281	282	283	284	285	286	287	288	289	
12	M	EM	—	M	—	M	M	—	—	M	
11	—	M	—	M	—	M	—	—	—	M	
10	M	M	M	M	M	M	EBM	M	M	M	
9	—	BM	—	BM	—	B	—	—	—	—	
8	EBM	—	EMB	EBM	B	EBM	B	EMB	EBM	EM	
7	B	BM	—	BM	—	B	—	—	—	M	
6	EBM	—	EMB	EBM	B	EBM	B	EMB	EMB	EM	
5	B	BM	—	BM	—	B	—	EM	—	EM	
4	EBM	M	M	EBM	EBM	M	EBM	—	M	—	
3	—	BM	—	M	—	M	—	—	—	M	
2	M	M	M	M	M	M	M	M	M	M	
1	—	M	—	M	—	M	—	—	—	M	
	290	291	292	293	294	295	296	297	298	299	
12	EMB	B	—	—	—	—	—	—	M	EBM	
11	—	M	—	—	—	—	—	—	M	EMB	
10	EB	EBM	—	—	M	M	M	M	EBM	EBM	
9	—	—	—	B	—	—	B	—	M	EMB	
8	EB	EBM	EBM	EBM	EBM	M	M	EMB	EBM	EBM	
7	—	—	B	B	—	B	B	EB	M	BM	
6	EMB	EMB	EMB	EBM	EBM	EMB	EMB	EMB	EBM	EBM	
5	—	—	B	B	—	B	B	—	M	BM	
4	EBM	—	M	M	M	M	M	EBM	EBM	EBM	
3	—	B	—	B	—	—	—	—	M	EMB	
2	—	EBM	—	—	M	M	—	—	M	EBM	
1	—	BM	—	—	—	—	—	—	M	EMB	

M – Make  
B – Break

See Reqt 2.11.

BM – Break Make  
EB – Early Break  
EM – Early Make  
FBM – Early Break Make  
EMB – Early Make Break

See Reqt 2.11 and 2.12.

TABLE A – SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT POSITIONS	SPRING COMBINATION FIGURE NUMBERS										
	300	301	302	303	304	305	306	307	308	309	
12	—	—	EM	—	EM	EM	EM	M	EM	EM	
11	—	—	—	—	BM	—	M	M	B	—	
10	M	EBM	—	M	M	M	EBM	EBM	M	M	
9	—	M	BM	—	B	B	B	—	BM	B	
8	EBM	EBM	—	EMB	M	EBM	EBM	EBM	—	EBM	
7	—	M	BM	—	B	B	B	—	B	B	
6	EBM	EBM	—	EMB	EM	EMB	EMB	EBM	—	B	
5	—	M	BM	—	B	B	B	—	B	BM	
4	EBM	EBM	—	EBM	M	EBM	EBM	EBM	M	EBM	
3	—	M	—	—	B	—	B	—	BM	—	
2	M	M	—	M	M	M	M	EBM	M	M	
1	—	—	—	—	M	M	M	M	M	M	
	310	311	312	313	314	315	316	317	318	319	
12	EM	EBM	EM	M	EBM	—	EBM	—	—	—	
11	—	EBM	—	M	BM	—	M	—	EMB	M	
10	M	EBM	M	EBM	EBM	—	EBM	M	—	M	
9	B	—	—	EB	M	B	M	B	EMB	—	
8	EB	B	EBM	EMB	EBM	—	EMB	EBM	EBM	EBM	
7	B	—	B	EB	—	B	EB	B	BM	—	
6	B	EMB	EMB	EMB	EBM	EBM	EMB	EBM	EBM	EMB	
5	B	—	—	B	—	B	—	B	BM	—	
4	M	M	EBM	EBM	M	—	EBM	M	—	M	
3	B	EB	—	EB	BM	—	M	B	EMB	—	
2	M	EBM	M	M	EBM	—	EBM	M	—	M	
1	—	EBM	—	M	BM	—	M	B	EMB	M	
	320	321	322	323	324	325	326	327	328	329	
12	EM	M	M	EBM	—	—	EBM	EM	—	—	
11	BM	M	EMB	M	—	—	BM	—	—	M	
10	M	M	—	EBM	EBM	EBM	EBM	M	EBM	M	
9	B	—	B	—	—	—	M	—	M	—	
8	EBM	EBM	—	—	EBM	M	EBM	M	EBM	M	
7	B	B	B	M	—	—	M	—	M	B	
6	EM	EBM	EB	EMB	EMB	EM	EBM	EMB	EMB	EMB	
5	B	B	B	—	—	—	M	—	M	B	
4	EBM	M	—	M	EBM	M	EBM	M	EBM	M	
3	M	B	B	—	—	—	BM	—	M	—	
2	EBM	M	M	EBM	EBM	EBM	EBM	M	EBM	—	
1	M	M	EMB	M	—	—	BM	M	—	M	

M – Make  
B – Break

See Reqt 2.11.

BM – Break Make  
EB – Early Break  
EM – Early Make  
EBM – Early Break Make  
EMB – Early Make Break

See Reqt 2.11 and 2.12.

TABLE A – SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT POSITIONS	SPRING COMBINATIONS FIGURE NUMBERS									
	330	331	332	333	334	335	336	337	338	339
12	EMB	M	M	M	—	—	EBM	EMB	M	EMB
11	M	—	M	EM	M	—	EMB	—	M	—
10	EBM	M	M	M	M	EBM	EBM	M	M	M
9	M	—	EB	EM	M	—	EMB	—	BM	—
8	EBM	EBM	EMB	M	B	EBM	EBM	EBM	EBM	—
7	M	EB	EB	EM	EBM	—	EMB	—	B	—
6	EM	EBM	EMB	M	B	EBM	EBM	EMB	—	—
5	M	EB	B	EM	EMB	—	EMB	B	BM	B
4	EBM	—	EBM	M	EBM	EBM	EBM	M	EBM	—
3	M	M	EBM	EM	M	—	EMB	—	M	BM
2	M	M	M	M	M	M	EBM	EBM	M	M
1	M	M	M	EM	M	—	EMB	—	M	M
	340	341	342	343	344	345	346	347		
12				EBM		M	EBM	EM		
11				M		—	EMB	—		
10				EBM		M	EBM	—		
9				M		—	EMB	—		
8				EBM		EBM	EBM	M		
7				M		—	B	—		
6				EBM		M	EBM	EMB		
5				M		B	BM	B		
4				EBM		M	EBM	—		
3				M		—	EMB	B		
2				EBM		M	EBM	M		
1				M		—	EMB	—		
	348	349	350	351	352					
12	—	M	M	—	M					
11	—	EMB	M	—	—					
10	M	EBM	M	—	EBM					
9	—	EM	M	—	—					
8	M	M	EBM	EBM	EMB					
7	B	B	M	B	EB					
6	EM	EBM	EBM	EM	EMB					
5	—	B	M	—	B					
4	M	M	EBM	EBM	EBM					
3	—	EMB	M	—	—					
2	—	M	M	—	M					
1	—	EMB	M	—	—					

M — Make  
B — Break

See Reqt 2.11.

BM — Break Make  
EB — Early Break  
EM — Early Make  
EBM — Early Break Make  
EMB — Early Make Break

See Reqt 2.11 and 2.12.

TABLE A – SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT POSITIONS	SPRING COMBINATIONS FIGURE NUMBERS									
	400	401	402	403	404	405	406	407	408	409
12	—	—	—	EM	—	—	EM	PBEM	—	—
11	—	—	—	—	—	—	—	—	—	—
10	M	EBM	EBM	EBM	—	EBM	EBM	—	EBM	M
9	—	PM	—	—	—	—	—	—	PMEB	—
8	EMB	—	—	EMB	—	—	EMB	EMB	EMB	EMB
7	B	—	—	B	—	—	B	—	BM	B
6	EBM	EBM	EBM	EBM	—	—	EBM	EBM	EBM	EBM
5	B	—	—	B	—	—	B	BM	BM	B
4	PM	PM	PM	PM	—	—	PM	—	PMEB	PM
3	—	M	—	—	—	—	B	B	BM	B
2	—	—	—	EM	—	PBEM	EM	EM	EM	—
1	—	—	—	—	—	—	—	B	—	—
	410	411	412	413	414	415	416	417	418	419
12	PB	—	PBEM	EM	PBEM	PBEM	—	PB	EM	—
11	M	BM	—	BM	BM	—	M	M	BM	M
10	M	EBM	—	M	EBM	EBM	EBM	EB	EBM	EBM
9	—	—	—	PMEB	PMEB	—	—	PM	—	—
8	EMB	EM	EMB	EMB	EMB	EMB	EMB	—	EM	EMB
7	—	B	—	B	BM	—	B	M	—	B
6	EBM	EBM	—	M	EBM	EBM	EBM	EBM	EBM	EBM
5	B	B	—	B	BM	—	B	M	—	B
4	—	PM	—	PMEB	PMEB	—	PM	—	PM	PMEB
3	—	B	—	M	BM	BM	—	M	BM	—
2	PBEM	EM	PBEM	PBEM	PBEM	PBEM	EM	PB	EM	PBEM
1	M	BM	—	M	BM	BM	M	M	M	M
	420	421	422	423	424	425	426	427		
12	EM	—	EM	PB	—	EMPB	EBM	EM		
11	B	—	B	M	BM	—	EBM	M		
10	M	M	M	EB	EBM	EBM	EBM	M		
9	—	—	PMEB	PM	—	—	EBM	—		
8	EM	EMB	EM	EM	EMB	EMB	EMB	EM		
7	B	B	B	M	B	—	PMEB	B		
6	EBM	EBM	EBM	EBM	EBM	EBM	EBM	EBM		
5	B	B	B	M	B	M	EMB	—		
4	PM	PM	PM	—	PMEB	—	EBM	PM		
3	B	B	B	M	—	B	EBM	M		
2	EM	EM	EM	PB	PBEM	—	EBM	EM		
1	B	—	B	M	M	M	EBM	M		

M — Make  
 B — Break  
 BM — Break Make  
 EB — Early Break  
 EM — Early Make  
 PM — Preliminary Make

See Reqt 2.11.

See Reqt 2.11 and 2.12.

PB — Preliminary Break  
 EBM — Early Break Make  
 EMB — Early Make Break  
 PBEM — Preliminary Break Early Make  
 PME B — Preliminary Make Early Break

See Reqt 2.11 and 2.12.

TABLE A – SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT POSITIONS	SPRING COMBINATION FIGURE NUMBER	
	500	501
12 & 24	M	B
11 & 23	M	B
10 & 22	M	B
9 & 21	M	B
8 & 20	M	B
7 & 19	M	B
6 & 18	M	B
5 & 17	M	B
4 & 16	M	B
3 & 15	M	B
2 & 14	M	B
1 & 13	M	B

M – Make      See Reqt 2.11.